



European Union Aviation Safety Agency

Comment-Response Document (CRD) 2021-14

RELATED NPA: 2021-14 — RMT.0230 (SUBTASK B)
16.12.2022



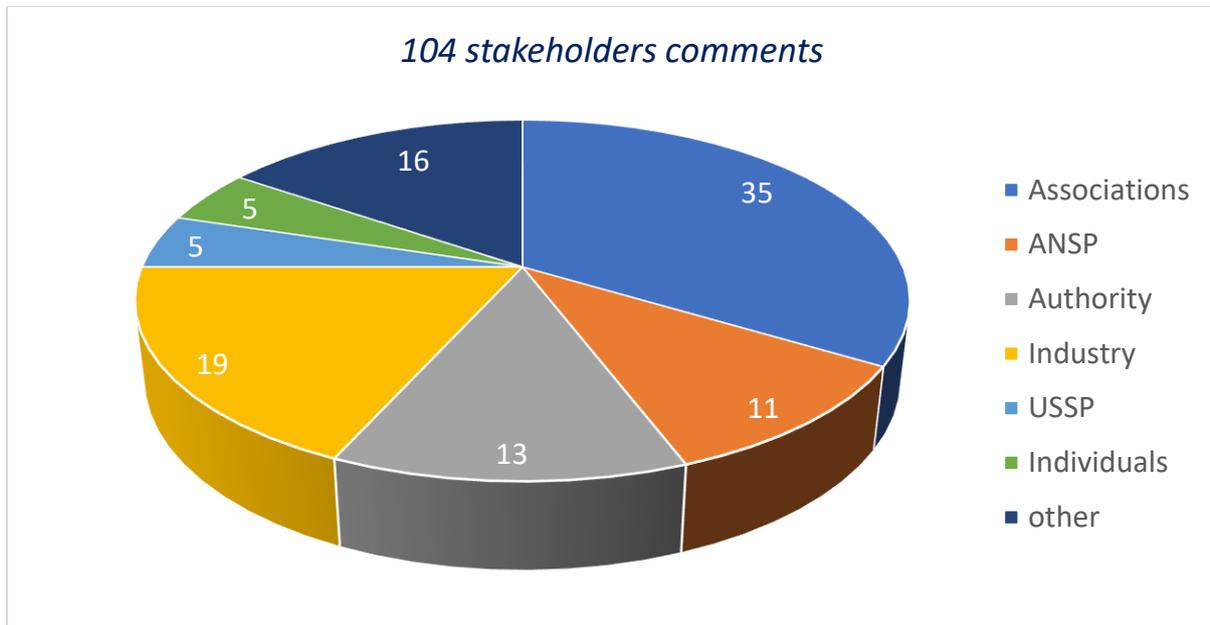
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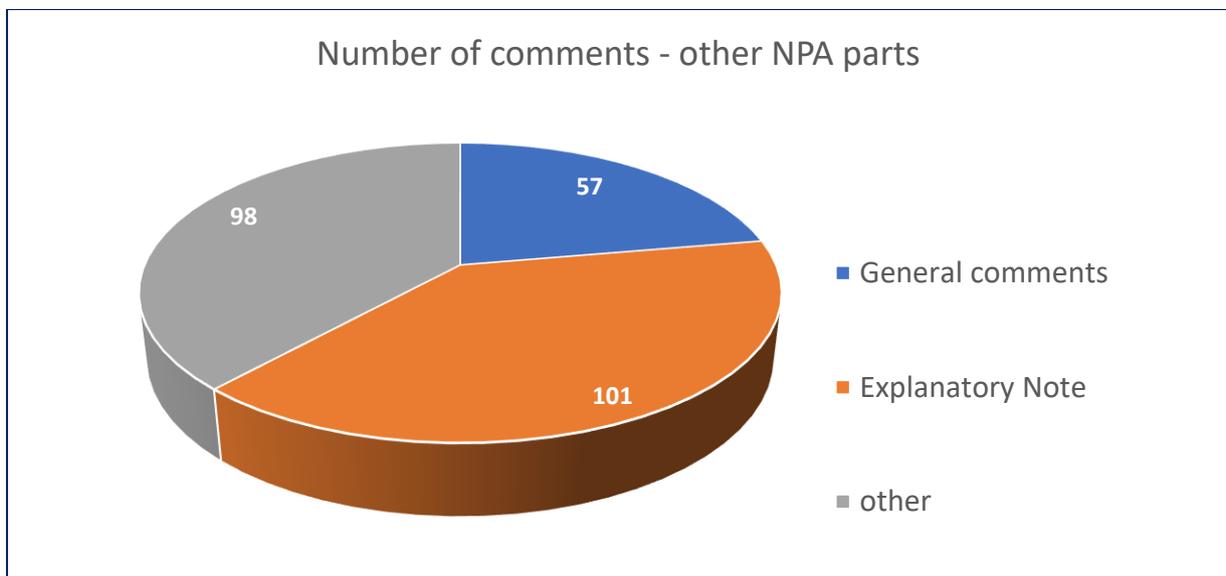


1. Summary of the outcome of the consultation

A total of 2 610 comments were received on NPA 2021-14 from 104 different stakeholders.

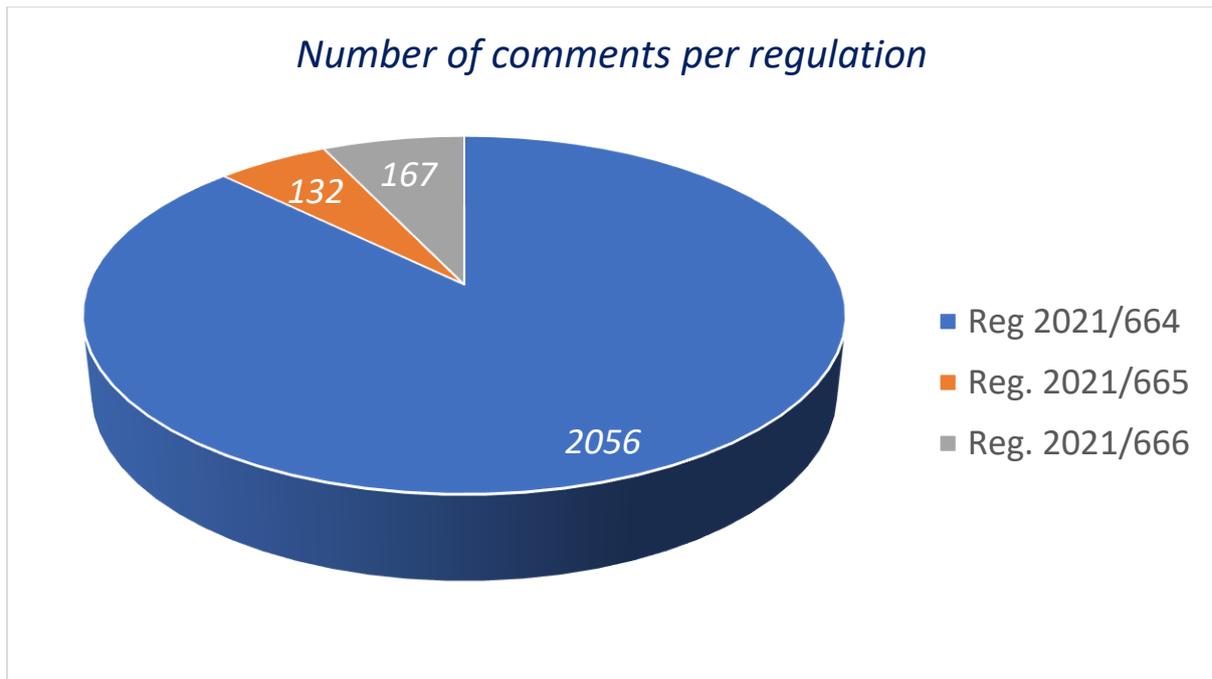


This diagram specifies the distribution of comments among the different stakeholders

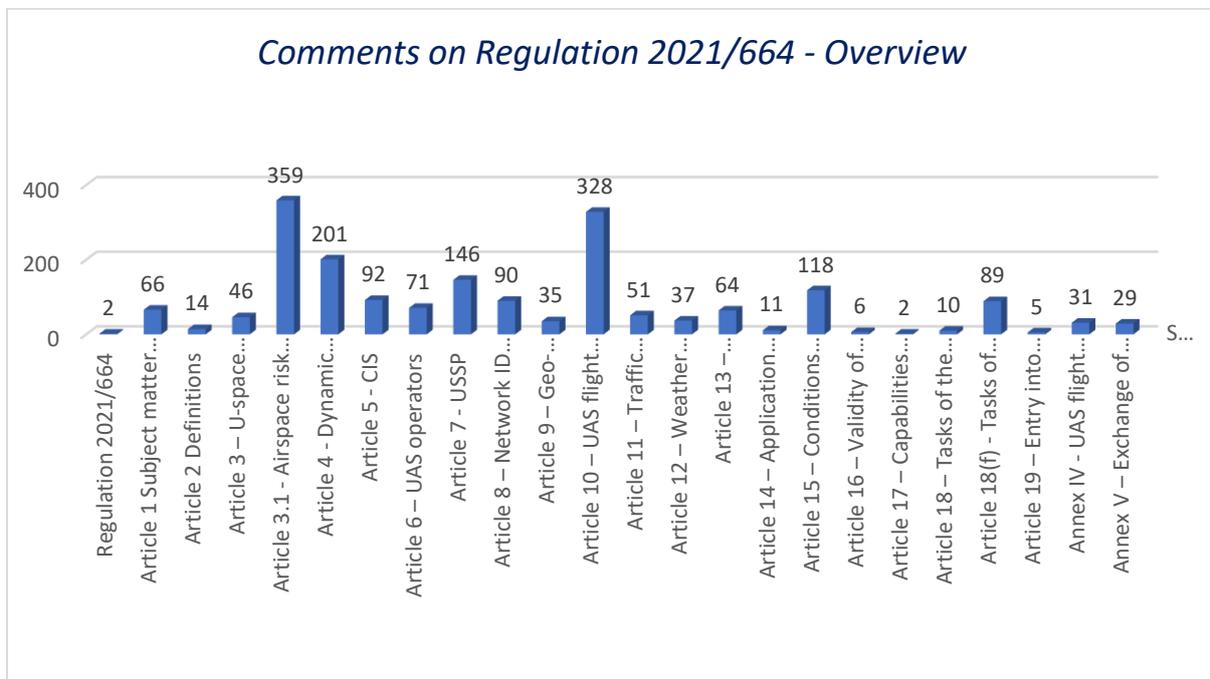


The Explanatory Note has been subject to many comments with more than a hundred.





The majority of the comments relate to Regulation (EU) 2021/664. This is due to the fact that this Regulation contains the main regulatory package including all the U-space services, the concept of U-space airspace and its management by the Member States in terms of risk assessment and responsibilities, the dynamic reconfiguration of the U-space airspace, the operational functioning of the common information services and the certification scheme for USSPs, among others.



This graphic shows the most commented provisions. The most commented subject relates to the airspace risk assessment, followed by the AMC/GM on the UAS flight authorisation service. The proposals on the dynamic airspace reconfiguration were also heavily commented with 201 comments.



2. Individual comments and responses

In responding to the comments, the following terminology is applied to attest EASA's position:

- (a) **Accepted** — EASA agrees with the comment and any proposed change is incorporated into the text.
- (b) **Partially accepted** — EASA either partially agrees with the comment or agrees with it but the proposed change is partially incorporated into the text.
- (c) **Noted** — EASA acknowledges the comment, but no change to the text is considered necessary.
- (d) **Not accepted** — EASA does not agree with the comment or proposed change.

General Comments

comment

Comment 1: U-Space Airspace volumes are not always well defined

Comment 2: A data link between the ATC in charge and the CIS is necessary to allow for a real time exchange of the air situation picture between the two.

Comment 3: method/protocol to interface with USSP services should be standardized, precised and harmonized accross Europe

Comment 4: The NPA 2021-14 includes more concept description than providing compliance means and many aspects are still open or not addressed.

Comment 5: A table of abbreviations should be added for easier reference.

Comment 6: The question of financing the development and operation of U-space is still outstanding. The costs should be covered solely by UAS operators/owners and shall not be transferred to the participants in manned aviation.

Comment 7: Drones who want to use existing airspace must adapt to the existing rules of manned aircraft and not the other way around.

Comment 8: A lot of elements are missing that will appear step by step with the implementation attempts. Actual implementation is always different from a pure paper drafting exercise and turning "words on paper" into "operational reality" will not be an easy process.

Comment 9: Existing research, technical development and systems should be noticed and identified as an option or ready-made solution for this concept.

Comment 10: U-Space concept should be implemented only into areas where really needed.

Comment 11: U-Space concept should be implemented step-by-step according to the phase of technical development to collect and utilize experience from the testing-phase.



Comment 12: Due to the early stage of U-Space concept it should be implemented below altitude 150m/ 500 FT AGL.

Comment 13: U-Space airspace designation should be uniform across all EU Member States to generate a single market for drones that encourages safety, innovation and societal acceptance. The current rules still lack clarity as to “where is U-Space” and as Member States are entitled to designate U-Space airspace merely on the basis of a risk assessment, this could lead to inconsistent and multiple interpretations of U-Space across Europe. We call on the introduction of clear guidelines on U-Space designation and to ensure a minimum level of consistency.

Comment 14: Ensuring a competitive U-Space: requirements to become a certified USSP are very strict and restrictive, which could prevent a lot of actors from being able to meet those strict requirements; this could result in lack of competition in the market.

Comment 15: Ensuring consistent implementation: The Regulation's application date (26 January 2023) is not a mandatory timeline for the implementation of U-Space, but rather a starting point for Member States to refer to the regulation. There is no consistency on when each Member States will start developing U-Space airspaces (some of them are already developing trial projects). It would be helpful to understand where Member States stand on the implementation, against this timeline.

Comment 16: The U-space regulation does not seem to be complying with the ICAO UTM framework for global harmonisation. What is the reasoning behind this decision taken to have separate rules in the EU? When do you plan to reconcile the U-space regulation with the ICAO UTM framework?

Comment 17: Some in the GA community consider that the NPA includes hidden provisions that could be harmful for them. Could you reassure them ?

Comment 18: The guidance provided in the NPA is not sufficient to clarify the concept of operation. In many cases, the AMC-GM are repeating the content of the articles of the IR, without providing additional useful information that is missing or on the contrary, extremely technical and detailed material based on industry standardisation documents (sometimes still in draft status). A number of sections of the explanatory note are superficial and do not provide the expected justification and explanations that could clarify the meaning or intention of some AMC or GM.

Comment 19: The current proposal is based on the (false) premise, that there is little traffic below 500 feet and more traffic above 500 feet. U-space should not be established in uncontrolled airspace, unless all the operations that take place in G and E, be it paragliding, model aircraft operations or speed flying – can seamlessly take place in the U-space airspace through conspicuity.

response

Comment 1: PARTIALLY ACCEPTED. There is no simple and generic definition of U-space but a series of attributes and needs. Clarification have been brought to the text.

Comment 2: NOTED. As per the Art 5 (2) and Annex II of the (EU) Regulation 2021/664, the ATC is a provider of common information, and may also adhere to the CIS.



Comment 3: NOTED. While ensuring interoperability is a key factor, at this stage of the implementation there is no consensus in the industry on how to exchange the information between USSP. It is then too premature to enforce a standard. Flexibility and local arrangements are offered to the USSP to define the most suitable way to exchange information.

Comment 4: PARTIALLY ACCEPTED. The NPA 2021-14 already offered in numerous areas detailed information. However, it is recognised that some compliance means had to be clarified and complemented (e.g. for Art 3(4), Art 7, Art 15).

Comment 5: NOTED. Definitions, including acronyms have been locally added.

Comment 6: NOTED. The implementation is supported by the numerous actors in aviation that are impacted by the U-space implementation. The affordability and flexibility of the proposed technical solutions (e.g. e-conspicuity) has been a key driver in the EASA approach.

Comment 7: NOTED. Ensuring safety continuum with manned aviation, while widely enabling integration of drones operations goes through adjustments of the existing usage of airspace. At this stage of the implementation, the required technical building blocks (e.g. DAA) are not available to ensure full and transparent integration of drones in the airspace.

Comment 8: NOTED. The AMC/GM have been refined and complemented to provide missing and more concrete or operational considerations.

Comment 9: NOTED. Outcome and feedback of research, when duly validated and relevant are considered by EASA in the frame of U-space implementation.

Comment 10: NOTED. EASA confirms that the whole airspace is not meant to become U-space, where the designation of U-space has an interest. The designation of U-space airspace is the responsibility of each Member State and guidance is provided to support the process of designation.

Comment 11: NOTED. The AMC/GM need to be developed enough to ensure the efficiency and safety of the first implementations. Nevertheless the AMC/GM will benefit from the experience gained from the first implementations.

Comment 12: NOTED. The limitation to 500ft has been consolidated and confirmed with the answers to the 'Question 1'. A new GM has been introduced.

Comment 13: NOTED. The designation of U-space is not mandatory, and as per the performance based approach underlying the U-space implementation, flexibility is offered. Variations may indeed exist on purpose. Nevertheless the AMC/GM have been clarified to ensure more consistent application, and EASA will foster harmonisation between Member States.

Comment 14: NOTED. The USSP will be subject to the same AMC/GM and certification activities, fairness will be ensured between competitors. The AMC/GM have been developed to enable drone operation while maintaining safety continuum with manned aviation. The overall level of safety should not be compromised, thus it may indeed be induced that some Applicants may not be eligible until they satisfy a certain level of quality. However, the U-space framework is performance based and the AMC/GM has been



tailored for the specificities of U-space and to enable as much as safely practicable the implementation.

Comment 15: NOTED. The designation of U-space is not mandatory, and as per the performance based approach underlying the U-space implementation, flexibility is offered to Member states (when, where,...). EASA will support and foster harmonisation between Member States.

Comment 16: NOTED. The U-space regulation complies with the ICAO UTM framework.

Comment 17: NOTED. The impact on the GA community is clearly identified and is related to SERA6005(c) and the need to be become conspicuous in U-space established in uncontrolled area.

Comment 18: PARTIALLY ACCEPTED. The NPA 2021-14 already offered in numerous areas detailed information. However, it is recognised that some concrete and operational perspective had to be complemented (e.g. for Art 3(4), Art 7, Art 15).

Comment 19: NOT ACCEPTED. Per the regulation applicable to GA the flight must not be conduct below 500 ft. The limitation of U-space ensures a first layer of strategic deconfliction between manned and unmanned aircraft. For the other kind of manned aircraft crossing U-space airspace in uncontrolled airspace, they shall make themselves conspicuous.

change to text YES

QUESTIONS TO STAKEHOLDERS

Q1 — Stakeholders are invited to express their opinion on the addition of this applicability and scope paragraph to final EASA's Decision with the AMC & GM limiting the applicability of those.

comment

- Although the limitation of scope and applicability is understandable from a technical standpoint, it will be very hard to develop procedures and implement U-space elements without a correct and up to date understanding of the legislation i.e. the AMC and GM.
- Utmost importance not to limit this application to a maximum height : doing so would hinder the emergence of advanced and innovative solutions, and some current pre-implementations of U-space do not have such height limitations (for instance implementation in CTR aiming at facilitating the provision of flight authorisations to UAS operators).
- Support the introduction of an upper limit of U-space. Several surveys in Europe have shown that namely UAVs carrying passengers lack social acceptance. The proposed step by-step-approach is reasonable. A maximum height of 500 ft/AGL for U-Space seems appropriate.



	<ul style="list-style-type: none"> Despite the fact that U-space airspaces have been considered as Very Low Level airspaces, the proposed AMC/GM should not be limited to certain low level heights.
response	<p>NOTED. EASA 23 stakeholders responded to Q1.</p> <p>15 are in favour of a limitation of scope.</p> <p>6 are not in favour of limiting the scope.</p> <p>2 are indecisive.</p>
change to text	<p>EASA will include an applicability and scope paragraph in the ED Decision limiting the application of the AMC & GM to cases of U-space implementation that concern U-space airspaces that are below certain altitude or height (e.g. low level airspace below 500 ft) and to certain UAS traffic and traffic complexity excluding the applicability for UAS operations carrying passengers for instance.</p>

Q2 — Stakeholders are invited to express their opinion on this provision. EASA welcomes any alternative proposal to cover the need of applying protection buffers within the U-space airspace to ensure segregation.

AMC1 Article 4 Dynamic airspace reconfiguration

SEGREGATION ASSURANCE

Protection buffers should be applied internally in the design phase, when assessing the volume of airspace to be designated as U-space airspace, so that flight authorisations are only granted to a specified vertical/horizontal distance from the U-space airspace limits. ATC would thus be entitled to manage any volume of controlled airspace external to the U-space airspace. The upper limit of the U-space airspace should be considered part of the U-space.

comment	<ul style="list-style-type: none"> support this formulation in principle and welcome proposal for applying buffers protection buffer is needed at least in some scenarios, but what is considered a sufficient distance to segregate/separate UAS from manned traffic should be determined taking into account whether the UAS is performing VLOS or BVLOS operations, and whether they are protected in relation to manned VFR or IFR traffic, in uncontrolled or controlled airspace. need to take into account buffers inside and outside the U-space airspace need to define an unambiguous, known and constant limit between U-space operations and ATM operations so that any portion of airspace external to U-space airspace can be fully managed using normal ATM standards and procedures. there seems to be no need to introduce additional buffers between a U space and the surrounding controlled airspace as the U space airspace can be reconfigured at any time. predetermined performance buffers are unable to account for the performance characteristics of UAS.
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response	NOTED. EASA acknowledges the comments received and note that no alternative proposal to the proposed AMC was sent. Therefore, the AMC will remain as it is. However it will be revised at a later stage, taking due account of the comments as it is considered that further assessment and possible consultation on this subject are needed.
change to text	NO

Q3 — Stakeholders are invited to provide their opinion on the possibility to express a latency number for the distribution of traffic information data to UAS operators.

AMC1 Article 5(2) Common information services

TIMELINESS

Traffic information should be made available with a latency that is lower than that necessary for the proper functioning of the traffic information service, in at least 99 % of the time.

comment	<ul style="list-style-type: none"> Stakeholders generally do not express a proposal for latency for the distribution of data for the network identification service. However, some proposals indicates a latency number of 5 seconds or between 10-20 seconds. Many comments underline that the number would depend on (1) the performance of the UAS (2) on the performance of the other air traffic (3) on the airspace risk assessment/safety case and the business model. Other comments highlight the need to express a latency for the traffic information service rather than including it in the CIS. In addition, such latency could only be derived from operational experience which is currently lacking that would provide more data and further research. Demonstration and validation would identify the best latency number for different use case.
response	NOTED. Text remains as it is and will be assessed in the future when further operational experience can support the determination of a latency value
change to text	NO.

Q4 — Stakeholders are invited to provide their opinion on the possibility to express a latency number for the distribution of data for the network identification service.

AMC2 Article 8(1) Network identification service

CONTINUOUS PROCESSING

USSPs should demonstrate a response time for distributing data received from the UAS or other service providers that is smaller than the latency necessary for the proper functioning of the traffic information service, this at least 99 % of the time.



comment	<ul style="list-style-type: none"> Stakeholders do not express a proposal for latency for the distribution of data for the network identification service. Many comments underline that the number would depend on (1) the performance of the UAS (2) on the performance of the other air traffic (3) on the risk assessment/safety case and the business model. Other comments highlight the need to express a latency for the traffic information service rather than for the network id. In addition, such latency could only be derived from operational experience which is currently lacking that would provide more data and further research. Demonstration and validation would identify the best latency number for different use case.
response	NOTED. Text remains as it is and will be assessed in the future when further operational experience can support the determination of a latency value
change to text	NO.

Subject matter and scope

comment	<p>GM1 Article 1(1)</p> <p>Comment 1: Some of the activities included are state e.g. excluded from the requirement for civil aviation and the other are public which should be included. Proposal: More clarification is needed.</p> <p>GM1 Article 1(3)</p> <p>Comment 2: Point (c)(3) means that certified UAS flying according to IFR rules could use either ATS or USSP services, while crewed IFR aircraft can only use ATS services. It should be considered to also enable crewed aircrafts (like UAS type #3) to use USSP services when flying in U-space airspace.</p> <p>Comment 3: c)(2) the need to register as operator is linked also to below 250g UAs when these UAs have cameras (sensor to capture private data).</p> <p>Comment 4: Please specify if exclusion from U-space provisions also covers those UAs in A1 subcategories which have cameras on board.</p> <p>Comment 5: Consider widening the applicability to include manned eVTOL operations.</p> <p>Comment 6: exemption of IFR UAS – “This does not exclude certified UAS from flying in U-space airspace with the support of U-space services” - More explanation needed - how can a certified UAS use U-s. services if the Art.1(3c) states that the Regulation shall not apply to operations of UAS conducted as IFR?</p>
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response

Comment 1: NOTED. Implicitly all civil operations are supported, emphasis is made on areas which required clarifications, such as state operations.

Comment 2: NOT ACCEPTED. At this stage of the implementation it is considered to premature to support operations with “humans on-board”. A GM is developed to clarify the possibilities.

Comment 3: ACCEPTED. Sentence removed.

Comment 4: NOTED. Yes, UAS < 250g are excluded.

Comment 5: NOT ACCEPTED. The regulatory framework for the manned eVTOL is not impacted by the introduction of the drone regulatory framework (with the sole exception for the SERA6005).

Comment 6: NOTED. Those UAS even if IFR capable may still be operated within U-space airspaces, provided to satisfy the conditions of the (EU) 2021/664.

change to text

YES

Definitions

comment

The cases to apply the dynamic airspace reconfiguration when short-term changes would be needed are not always exceptional.

response

This GM only provide some examples of cases when such dynamic airspace reconfiguration should be applied. Other cases may exist. Of course, every time there is a need to apply such reconfiguration, it shall be done.

change to text

YES

U-space airspace and airspace risk assessment

comment

Generic comments

Comment 1: The U-space airspace should enable the drones operation not restrict them.

Comment 2: The U-space airspace designation, Risk Assessment, definition of the performance requirements, etc... require harmonisation to ensure safe and consistent harmonisation between stakeholders (MS, competent authorities, etc...).

Comment 3: Who is responsible for conducting the airspace risk assessment?

Comment 4: Clear triggers and pros and cons to established U-space airspace should be established.

Comment 5: AMC/GM related to the Art.3(4) are missing.



response	<p>Comment 6: An AMC/GM should describe the cross-border U-space setup.</p> <p>Comment 1: NOT ACCEPTED. The U-space design has necessarily to establish boundaries and acceptability criteria to ensure a safe design and to ensure safe management of the operations. EASA reminds that U-space is meant to safely enable dense and complex drones operation (e.g. BVLOS).</p> <p>Comment 2: NOTED. EASA has launched harmonisation activities to ensure alignment between stakeholders.</p> <p>Comment 3: NOTED. The airspace risk assessment has to be performed by a “competent authority” designated by the Member State. Clarifications are provided in the AMC/GM to the Article 18(f).</p> <p>Comment 4: NOTED. EASA may further complete the set of AMC/GM to clarify those criteria.</p> <p>Comment 5: ACCEPTED. AMC/GM to Art.3(4) have been developed.</p> <p>Comment 6: NOTED. Complementary AMC/GM maybe further elaborated to address the cross-border operations.</p>
change to text	Yes
comment	<p>AMC1 Article 3(1) U-space airspace</p> <p>Comment 1: Clarification needed for “exposure of harm” since it is not a common notion in risk assessments. Please provide explanation.</p> <p>Comment 2: GM4 Article 3(1) letter (c) paragraph (2), states “[...] which are created by the potential failure of the U-space functional system.” Please define “U-space functional system”.</p> <p>Comment 3: The airspace risk assessment should be made before the establishment of the U-space airspace and before changes to the U-space airspace affecting the initial airspace risk assessment are introduced.”</p>
response	<p>Comment 1: PARTIALLY ACCEPTED. Changes made to AMC1 (a)(2)</p> <p>Comment 2: PARTIALLY ACCEPTED. Definition added in the Art 15</p> <p>Comment 3: PARTIALLY ACCEPTED. Changes made to AMC1 b)</p>
change to text	Yes
comment	<p>AMC1 Article 3(1) U-space airspace</p> <p>There is a need for an overall safety and risk assessment for all hazards so far identified with regard to drone operations.</p> <p>Partial safety cases or risk assessment will not prove that an overall safety case is still achieving positive values.</p> <p>On top of that: How can a risk be assessed adequately at all? A risk might be very subjective. The establishment of a methodology for risk assessments for specific category type of operation (e.g., SORA, assessment for re-defined scenario) is not part of the scope of this section; however, this Item should be identified for further research.</p> <p>What is the exact Target Levels of Safety shall be in terms of fatalities per hours of operation / year / million movements? And how this will be measured?</p> <p>The mitigation measures established by the UAS operator limit the risk of operation to an acceptable level, but might interfere with the mission planned.</p>



response	<p>The question arises, however, what “acceptable level” means at all? Who defines that?</p> <p>NOTED.</p> <p>The way the Target level of safety is considered in this document is that there are two possible levels of granularity. There could be a qualitative level and quantitative level to determine it. It’s up to each member state and depending on their local environment to evaluate how confident they are in assuring a specific level of safety. Most will have to start by the qualitative (based on risk perception and social acceptability) while the quantitative level will come later with the recording of data and further experience.</p>
change to text	No
comment	<p>GM1 Article 3(1) U-space airspace</p> <p>(a) (2), suggested the following sentence: "To create a known traffic environment by means of conspicuity." Not to leave an impression that UAS compromise the safety if not visible to ATC.</p>
response	PARTIALLY ACCEPTED.
change to text	Yes
comment	<p>GM1 Article 3(1) U-space airspace</p> <p>How U-space is meant to support detection of unlawful or malicious operations ?</p>
response	<p>NOTED.</p> <p>The Network Information service and Traffic Information helps to discriminate between authorised and non-authorised operations. Some MS may set-up means to ensure that the detection is possible.</p>
change to text	Yes
comment	<p>GM2 Article 3(1) Airspace Risk Assessment - General</p> <p>Clarification needed for the execution of SORA by UAS operators, regarding their role and the inputs from the airspace risk assessment.</p>
response	ACCEPTED. The conditions under which operators shall execute SORA and how it feeds from Airspace Risk Assessment are clarified.
change to text	Yes
comment	<p>GM3 Article 3(1) Airspace Risk Assessment – Process phases</p> <p>Comment 1: There were requests to include the mitigation phase inside airspace risk assessment and not outside the process.</p>



response	<p>Comment 2: Request to develop and AMC/GM related to Article 3.3. or to deal with this topics in the Airspace risk assessment section.</p> <p>Comment 3: It was requested to develop standardize safety criteria so that each member state does not have to develop their own safety criteria in an isolated/standalone way.</p> <p>Comment 4: Dealing with collision between two unmanned aircraft that will not produce casualties in the air but fly over populated areas.</p> <p>Comment 5: Some paragraphs read more like a rationale than providing clear guidance and focusing on temporary nature.</p> <p>Comment 6: Should the risk assessment methods as "approved under EU 2017/373-legislation" part of the U-space airspace risk assessment - or is the risk assessment for those risks not related to performing ATS service?</p> <p>Comment 6: Why is the ground infrastructure "assessed"? Is this about the real estate value of buildings? Could a common data format for interviews with stakeholders be other than text documents?</p>
change to text	<p>Comment 1: NOTED. The risk assessment is an iterative process; based on the outcome of the analysis, expert judgment, consultation, etc. and this will include the determination of mitigations.</p> <p>Comment 2: ACCEPTED. The relationship between the airspace risk assessment and articles 3.3 and 3.4 is included.</p> <p>Comment 3: PARTIALLY ACCEPTED. More guidance on how to develop safety criteria are included as well as on the risks to look at and the possible comparison with other aviation or non-aviation risk measures. Criteria may be further developed.</p> <p>Comment 4: ACCEPTED. Some justifications are included on how these flights may potentially produce casualties on the ground as the collided UAS will inevitably fall over the populated area.</p> <p>Comment 5: ACCEPTED. The paragraphs not providing clear guidance are deleted and replaced by clearer guidance regarding acceptable levels of safety and definition of safety criteria.</p> <p>Comment 6: NOTED. Methodology is partially common but in one case we are assessing different things the introduction of UAS operations in an airspace while in the other we are assessing changes to the functional system ATM/ANS. The U-space is nevertheless independent from the 2017/373.</p> <p>Comment 7: NOT ACCEPTED. Ground infrastructure needs to be assessed because it includes electromagnetic emitting sites, tall buildings, obstacles, strategic and critical infrastructure etc.</p>
comment	<p>GM4 Article 3(1) Airspace Risk Assessment – Checklist template</p> <p>Numerous criteria should be added, such as: Suggested to add GM4 Article 3(1) details the manned-aviation restricted areas, it could be necessary to include Control Zones (CTR), Control Areas (CTA) and Terminal Control Areas (TMA), Airports association, SRD 860 coverage, etc... Others to be removed, such as cranes.</p>
response	<p>PARTIALLY ACCEPTED. The checklist has been deeply revised.</p>



change to text	Yes
comment	GM5 Article 3(1) Airspace Risk Assessment – Target Level of Safety The TLS approach is hardly manageable (e.g. lack of clear quantitative figure) and applicable, and should be revised.
response	ACCEPTED. The notion of TLS has been improved to Acceptable level of safety “ALS”, and the whole approach deeply revised.
change to text	Yes
comment	GM6 Article 3(1) Airspace Risk Assessment – Other Risks Suggested to add EUROCAE ED-201A standard to GM6.
response	ACCEPTED. A clearing statement has been includes in section (c).
change to text	Yes
comment	GM6 Article 3(1) Airspace Risk Assessment – Other Risks Why do schools and hospitals deserve special attention with regard to environmental risks?
response	REJECTED. Schools and hospitals are important infrastructure with large vulnerable populations where quiet is a necessity. Airspace risk assessment does not take individual flights into account; that is the job of operational risk assessments.
change to text	Yes
comment	GM6 Article 3(1) Airspace Risk Assessment – Other Risks The TLS to be considered in relation to the overall safety including manned traffic and guidance on the interaction between the safety assessments of the manned traffic airspace and the U-SPACE airspace
response	ACCEPTED. References to Regulation (EU) 2017/373 are added, which ensures compatibility between the latter Regulation and the U-space regulation regarding the safety assessment.
change to text	Yes, in the GM related to the Acceptable of Safety

Dynamic airspace reconfiguration

comment **GM2 ATS.TR.237(b)**



	What s early enough? There must be a clear rule with time limits i.e a reference table which includes speed, complexity factors etc... e less informal and design the whole process and reconfig the overall concept more robust and into the direction of automatization
response	NOTED. This GM emphasizes on the importance of activating the DAR process as soon as possible, when ATC has reason to consider airspace reconfiguration. Time could vary according to circumstances. The whole U-space regulatory framework leads towards automatization.
change to text	No
comment	GM2 ATS.TR.237(a) Statements are based on a dangerously wrong assumption about activities in the lower airspace. UAS operations should not take place at all, without taking the above into due account. Furthermore, U-space should not be established in uncontrolled airspace, unless all the above operations – as well as model aircraft operations – can seamlessly take place in the U-space airspace through conspicuity.
response	NOTED. The quoted assumptions are qualitative, although based on a reasonable evaluation of manned traffic figures at VLL, compared to total amounts. The presence of manned traffic at VLL is understood, and addressed within the operational framework established by the IR.
change to text	No
comment	It is suggested to develop a more comprehensive set of right of way rules at the level of SERA.3210 level to manage the collision risk between UAS and other aircraft in the same airspace. Dynamic reconfiguration of the U-space airspace paragraph indicates "there may be instances where manned traffic does not necessarily have priority over unmanned. While it would be premature, at this stage, to engage in establishing a detailed order of priority, the subject should be addressed in the relevant soft law."
response	NOTED. The Regulatory framework, may evolve when once more experience and confidence will have be gained from the field.
change to text	No
comment	We recommend EASA give member states the option to implement ADS-B UAT TIS-B which can provide a real time traffic picture of both manned and unmanned traffic on EFB applications in the manned cockpit and on the Ground Control Station of the UAS operator.
response	NOTED. It is addressed in the comments on e-conspicuity.
change to text	No
comment	AMC1 ATS.OR.127(a)



	If SERA Article 4 (1) defines special operations for all aircraft, then this paragraph should reference "special operations as defined by SERA Article 4 (1)".
response	NOTED. SERA.4001 is referred to in that very same AMC.
change to text	No
comment	GM1 ATS.TR.237(a) The current text "Airspace design criteria imply the inclusion in airspace structures (e.g. ATZs, CTRs) of volumes of airspace, mostly at very low level, which are not actually of use to manned traffic" is insufficient to cover the issue explained in the general comment. Make reference to 2019/123 in the text and add an AMC to provide means to ensure availability of relevant U-space information for flight planning to Network
response	NOT ACCEPTED. The dynamic airspace reconfiguration is different from airspace structure designation. In addition, DAR is not supposed to impact flight planning.
change to text	No
comment	ATC may need to take the decision to reconfigure due to operational needs, like changing runways due to wind or enabling more landings, from a non-standard runway or because of unscheduled runway inspections. During these scenarios it is worth noticing that reconfiguring of U-Space airspace should not change focus for the ATCO's. System support should be considered and part of the plan.
response	NOTED. While ATC has the final decision, a balanced approach is recommended.
change to text	No
comment	Please elaborate how IR 2019/847 & IR 2021/6664 shall coexist, e.g. what is the difference for the different types of drone operations (weight, Class, multicopter/fixed-wing, certificate, VLOS/BVLOS).
response	NOTED. In the framework of Regulation 2019/947, specific capabilities and performance requirements are set in accordance with Regulation 2021/664 Article 3 (4) (a), based on the airspace risk assessment.
change to text	No
comment	AMC1 ATS.TR.237(a) Keep in mind that safety reasons not only appear from manned aircraft. Mostly the use of manned aircraft for safety and security tasks (Emergency medical service, disaster relief) will be the reason.
response	NOTED.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)



	<p>If controlled airspace is above a u-space airspace, a 150m vertical buffer should be in place. If controlled airspace is next to a u-space airspace, a 2km horizontal buffer should be applied. If a u-space airspace is next to uncontrolled (class G) airspace, no buffer is foreseen.</p>
response	<p>NOTED. While the proposed figures seem reasonable, the rationale is missing. Please see above the part related to the questions to stakeholders, in particular Question 2.</p>
change to text	<p>No</p>
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>Add "Values of protection buffers should be taken into account for and consistent with the UAS performance requirements for a given U-Space airspace, specifically those requirements related to lateral and vertical navigational performance or containment criteria."</p>
response	<p>ACCEPTED. Please see above the part related to the questions to stakeholders, in particular Question 2.</p>
change to text	<p>YES</p>
comment	<p>GM1 Article 4(f)</p> <p>How shall the activation or deactivation of the U-Space airspace take place? <u>Who can</u> / shall activate/ deactivate the airspace in which time period?</p>
response	<p>NOTED. Please see above the part related to the questions to stakeholders, in particular Question 2.</p>
change to text	<p>No</p>
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>Option where the buffer is located inside the U-space airspace is preferred. There is a need to define an unambiguous, known and constant limit between U-space operations and ATM operations so that any portion of airspace external to U-space airspace can be fully managed using normal ATM standards and procedures (ex. PANS-OPS, radar vectoring).</p>
response	<p>NOTED. Please see above the part related to the questions to stakeholders, in particular Question 2.</p>
change to text	<p>No</p>
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>EASA should describe criteria's for applicable airspace buffers on the inside of a U-space airspace but also take into the account for segregation and separation outside a U-space airspace where ATS is provided. The criterias should at least follow the unified principals</p>



	described in the Eurocontrol ASM handbook in order to allow for harmonized cross border operations.
response	NOTED. AMC1 Art. 4 only refers to the fact that buffers should be applied internally. GM2 Art.4 deals with criteria to determine those buffers. The final decision is left to Member States through the airspace risk assessment, with reference to UAS capabilities and performance. The assessment could take into account, as far as practicable, the Eurocontrol ASM HB, when deemed appropriate. Please see above the part related to the questions to stakeholders, in particular Question 2.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) It is important to note that in the case of a dynamic reconfiguration tool for TWR ATCOs the implementation of such new solutions requires time. This includes not only the need to develop the technology but with this comes in hand with the development of new operational procedures and the need to train ATCOs accordingly.
response	NOTED. Existing ATC procedures should allow for the management of properly designed U-space airspace.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration Our position is positive to the proposal for the initial deployment of U-space. In future evolutions, however, we consider that protection buffers can be dynamically estimated based on the operational risk and aircraft performances.
response	ACCEPTED. The comment is integrated within the AMC/GM to the Art 3(4), and to be considered in the design in the U-space Airspace.
change to text	Yes
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) Height is a very inaccurate parameter in aviation. Hence a buffer is essential, and because establishing the size of this buffer is a very complex calculation it should not be left to the operators to establish it, but be included within the U space airspace.
response	Noted. This is the approach in the proposed GM. Please see above the part related to the questions to stakeholders, in particular Question 2.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) Answer to Q2: With the concept in place, there seems to be no need to introduce additional buffers between a U-space and the surrounding controlled airspace. Besides, as the U-space



	airspace can be reconfigured at any time, there is no added value in having such a buffer. It would only be useful, if it protected the U-space from spontaneous airspace reconfigurations.
response	NOTED. The comment suggests bufferisation being sufficiently implicit in Reg. 2019/947. This does not seem contradictory to the proposed AMC. Please see above the part related to the questions to stakeholders, in particular Question 2.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) Who will determine what these buffers should be? National authority or EASA?
response	Noted. The NAA through the U-space airspace risk assessment.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) Answer to Q2: No alternative solution is proposed but a viable solution should be explained in the final Opinion
response	NOTED. In the U-space regulatory package, DAR is in principle not intended for “regular” application; occasional reconfigurations by ATC should accommodate occasional military needs. However, the airspace risk assessment might take into account regular alternate usage of an airspace volume (i.e. fixed time slots for drones, other slots for the military). More flexibility could be too disruptive for UAS operations, thus implying that such volume of airspace is not suitable for U-space designation. Please see above the part related to the questions to stakeholders, in particular Question 2.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) The protection buffer provision is supported if this one is correlated and consistent with the level of performance specified for the UAS by the member state.
response	NOTED. Please see above the part related to the questions to stakeholders, in particular Question 2. The comment is integrated within the AMC/GM to the Art 3(4), and to be considered in the design in the U-space Airspace.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) This AMC should be more precise, or alternatively additional AMC/GM should be developed to support it. It is obvious that protection buffer is needed, but what is considered a sufficient distance to segregate/separate UAS from manned traffic?



response	<p>PARTIALLY ACCEPTED.. AMC1 Art. 4 only refers to the fact that buffers should be applied internally. GM2 Art.4 deals with criteria to determine those buffers. The final decision is left to Member States through the airspace risk assessment, with reference to UAS capabilities and performance. Please see above the part related to the questions to stakeholders, in particular Question 2.</p> <p>EASA also deems necessary to clarify this aspect regarding the expected outcome of Article 3(4).</p>
change to text	Yes, completed in AMC/GM to Article 3(4)
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>It is important to underline that once the U-space is deactivated it turns into ATS airspace with its own classification and services. Proposed text: "The ATC unit will clear the manned aircraft to enter the deactivated portion of U-space airspace once it is confirmed that segregation from UAS traffic is achieved."</p>
response	NOT ACCEPTED. The GM refers to the ATCO perspective, as judgement based on any available information.
change to text	No
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>AMC1 Article 4 Dynamic airspace reconfiguration, segregation assurance, Q2 – stakeholders opinion ?</p> <p>Buffers shall be defined within U-space airspace when designing this U-space airspace. These buffers shall be determined after safety assessment during which separation minima between manned and unmanned aircraft will be defined. Moreover, having buffers inside will limit ATCO's workload who will take care about the U-space airspace limits depicted in their screens/viewers without creating virtually an additional buffer line.</p>
response	PARTIALLY ACCEPTED. Please see above the part related to the questions to stakeholders, in particular Question 2.
change to text	Yes
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>The concept of a safety buffer is supported as a temporary measure. This measure should be in place until or unless other (technological/procedural) means allow for the safe operation of UAS in the given U-space airspace(s).</p>



response	NOTED. Please see above the part related to the questions to stakeholders, in particular Question 2.
change to text	No
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>Protection buffers should be determined inside the volume of the airspace to be designated as U-space airspace, so that flight authorisation are only granted to a specified vertical/horizontal distance when a reconfiguration of the U-Space airspace is effected.</p>
response	PARTIALLY ACCEPTED. The AMC explicitly refers to the design/assessment phase. Nevertheless EASA deems necessary to clarify this aspect regarding the expected outcome of Article 3(4).
change to text	Yes, completed in AMC/GM to Article 3(4)
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>In order to contain the drone operations within U-Space, an activity buffer (both horizontally/laterally) shall be applied within the published U Space. Within this activity buffer no drone operations are allowed and ATC can operate their traffic outside the U Space without interference of the U Space users.</p>
response	NOTED. The comment is in line with the proposed AMC text.
change to text	No
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>Protection buffers could be adapted to the actual performance of the UAS considering:</p> <ul style="list-style-type: none"> • UAS navigation capability accuracy, integrity and reliability, and • DAA capability as well as reliability
response	PARTIALLY ACCEPTED.
change to text	Yes, completed in AMC/GM to Article 3(4)
comment	<p>AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders)</p> <p>A performance based requirement depending on the user's navigation and vertical accuracy is recommended. A common altitude reference service is required for vertical accuracy.</p>
response	NOTED. Please see above the part related to the questions to stakeholders, in particular Question 2.
change to text	No



comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) How would applying buffers to the U-Space airspace make flights to/from other types of airspace possible, e.g. a flight starting in U-space airspace but ending in ordinary uncontrolled airspace (class G)? Would it be possible to get flight authorisation for such a flight since the UAS would then have to pass through the buffer? If not possible then these buffers might not be a good idea. Please clarify.
response	NOTED. UAS operations outside U-space airspace may continue taking place in accordance with national regulations.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) U-spaces within CTR's or within any airspace in which a lot of manned aviation is active, the use of protection buffers might show their benefit. We propose to ensure that the protection buffers are not overlapping with the UAS flight authorisation volumes (4D) including the deviation thresholds to guarantee segregation which is envisaged.
response	NOT ACCEPTED. AMC1 Art. 4 only refers to the fact that buffers should be applied internally. GM2 Art.4 deals with criteria to determine those buffers. The final decision is left to Member States through the airspace risk assessment, with reference to UAS capabilities and performance.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) “A U-space airspace would initially be designated in a volume of airspace where UAS operations will be the norm and where manned aircraft operations will be the exception.” Due to the high number of hospitals in cities, helicopter traffic would be the rule rather than the exception. What solution would the U-space concept provide for cities located in a controlled airspace?
response	NOTED. The regulatory framework proposed for U-space takes into account the traffic today. In the future, it is expected that this statement could be different.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) The proposed principle that buffers are included within the U-space airspace makes sense and is welcome. However, there is no reason to indicate that the upper limit of that airspace is part of U-space airspace since it cannot be flown by a UAS due to the buffer. Change text to read: "The upper limit of the U-space airspace should not be considered part of the U-space airspace." Alternatively, this sentence could be simply removed and the local airspace description left to local ANSP to determine the optimal set-up.
response	ACCEPTED. The sentence is removed.



change to text	Yes
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) In delegated airspace, how is U-space handled there? Which country is doing and allowing what? How shall the dynamic reconfiguration work here?
response	NOTED. DAR is applied by ATC within its area of responsibility, whether or not in delegated airspace.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) Text: "ATC would thus be entitled to manage any volume of controlled airspace external to the U-space airspace." Comment: Uncontrolled airspace also needs to be taken into consideration
response	NOTED. However ATC is not provided in uncontrolled airspace.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) What sort of vertical separation should then be used between top of U-Space airspace and manned aviation? The smaller the separation the smaller the burden to ATS units.
response	NOTED. As buffers are applied internally, ATC is entitled to manage any volume of controlled airspace external to the designated U-space airspace; no additional vertical separation is required.
change to text	No
comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) UAS operations are described by their operational volume and there should be no need for additional buffers as the operation (certainty 95%) is kept within the defined U-space boundaries. It should be possible to define 2 separate U-spaces beside each other without having any (buffer) gaps.
response	NOTED. Although very-low level is not defined in the U-space regulatory package, the expression appears in NPA 2021-14 as referred to "airspace below 500 ft". While the concept of operating UAS up to 400 ft AGL is widely understood with the aim of staying adequately below minimum flight altitudes, the buffer applicable to a specific U-space airspace should be part of the relevant airspace risk assessment.
change to text	No



comment	AMC1 Article 4 Dynamic airspace reconfiguration (Q2 to Stakeholders) Segregation buffer: please consider the separation ATS need to keep to the border of the area, and how close to a border a manned aircraft may fly in controlled and uncontrolled airspace, when deciding which buffer is relevant on the inside of the U-space.
response	NOTED. AMC1 Art. 4 refers to the fact that buffers should be applied internally to a designated U-space airspace, to ensure segregation between unmanned traffic inside and manned traffic outside. GM2 Art.4 deals with criteria to determine those buffers. The final decision is left to Member States through the airspace risk assessment, with reference to UAS capabilities and performance, in the design phase. In the proposed version, no further external spacing would be required.
change to text	No

comment	GM1 Article 4(h)(J) <u>Item h</u> The Dynamic Airspace Reconfiguration (hereafter: DAR) procedure should be as follows: The ATC unit should instruct the USSP to clear the required piece of the u-space airspace, giving location/block as well as the start time. End time is optional, the ATC unit may not know in advance the duration of the DAR. The USSP is in charge of u-space airspace, and must heed ATC instructions. See also: AMC1 Article 7(3) U-space service providers <u>items h and j</u> Technically, the ATC unit cannot not give a clearance to a manned (IFR or VFR) aircraft to enter the u-space airspace (within controlled airspace), since only UAS are allowed there. DAR reclaims the u-space airspace from the USSP temporarily, correct? See appendix in 2021/664. If it is u-space in class G airspace, is the USSP in charge of providing traffic information to the manned IFR/VFR flight and any drones flying there? <u>item j</u> Confirmation that the required airspace will be vacated by the USSP should be implicit. Procedures should be in place, established via contracts between USSP and ATC, allowing the USSP a set amount of time to vacate the requested airspace. The USSP must have procedures in place allowing for the immediate de-activation/restructuring of the airspace. All users must be made aware of this procedure and ideally trained in using it. Considering the reasons behind DAR, it may not be possible to wait for confirmation by the USSP.
response	PARTIALLY ACCEPTED 1) Although it is understood that ATC has the final decision, totally discarding any form of coordination might turn out to be operationally non-viable and, ultimately, unsafe. AS UAS operators might simply be unable to comply in the desired timeframe, the option of clearing manned traffic into a volume of airspace designated as U-space without such coordination should be confined to contingencies. 2) By definition, it may be correct that, while reconfigured, the airspace is no longer U-space airspace (“temporary modification of the U-space airspace by adjusting the geographical limits”); 3) Acknowledgement to ATC should be performed when U-space is clear of UAS traffic.



change to text	<p>It is nevertheless correct to consider that the DAR requires coordination. Clarifications are added to AMC/GM to Articles 6 and 7.</p> <p>Yes</p>
comment	<p>GM1 Article 4 Dynamic airspace reconfiguration</p> <p>1) Please delete the following sentence in section (d): "A U-space airspace would initially be designated in a volume of airspace where UAS operations will be the norm and where manned aircraft operations will be the exception." Please change the first sentence of section (f): "Operationally, the ATC unit <u>or the certified CIS</u> will inform the USSPs, as part of the CIS, that certain portions [...]." <i>If there is a CIS at place, the information should be transferred through it and not directly from ATC to USSP.</i></p> <p>2) Please change the the first sentence of section (h): "If the ATC unit intends to issue a clearance for a manned aircraft to enter the U-space airspace it will initiate a dynamic airspace reconfiguration procedure and inform the CIS. The ATC or the CIS - who ever is reponsible - will publish the information."</p> <p>3) Please change the following sentence in section (i): "USSP <u>or the CIS</u> will notify the ATC unit [...]"</p> <p>4) <i>The CIS is the single source of truth and should therefore publish all information.</i></p>
response	<p>1) ACCEPTED. 2) Partially ACCEPTED. The text is amended accordingly. 3) ACCEPTED. The text is amended accordingly 4) NOT ACCEPTED. The notification is made by the USSP, not the CIS provider.</p>
change to text	<p>Yes</p>
comment	<p>GM1 Article 4(b)</p> <p>Scope is already clarified in the AMC/GM and repetition should be avoided. Delete bullet (b)</p>
response	<p>ACCEPTED.</p>
change to text	<p>Yes</p>
comment	<p>GM1 Article 4 Dynamic airspace reconfiguration bullet (g)</p> <p>In regards to establishing the time margins on a case-by-case basis, add the following explanation: Add: "It should be considered whether a single ATC unit may interface with multiple U-Space Airspaces. In such cases, having different coordination parameters for each such airspace would further complexify the dynamic</p>



	reconfiguration process. ATC units tend to drive towards harmonised coordination procedures, and USSPs and UAS performance requirements should be defined to accommodate that."
response	Noted
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace reconfiguration bullet (h)</p> <p>Remark: Ability of ATC to define a safety margin on a case-by-case basis will only be possible in advanced applications, and only once the performance characteristics (in particular, vertical and lateral navigational accuracy) of the UAS are standardised. In the initial application, the operational intent volumes of UAS (as defined in the ASTM F38 Standard for UTM/USS Interface) will have the containment criteria sufficient for the target safety level of the prevention of collision UAS-UAS, that is, not sufficient for the prevention of collision UAS-manned aircraft. Therefore, ATC cannot define its decisions based on the submitted operational intent volumes of UAS for the prevention of manned aircraft, but has to start with larger buffers that cannot be tactically applied. Add at the beginning of the second sentence: "In the advanced applications, where it is not required to deactivate the entire U-Space Airspace volume..."</p>
response	ACCEPTED. "This restriction will cover the necessary operational volume for the manned aircraft with a sufficient safety margin taking UAS and manned aircraft navigational performances into account" is deleted.
change to text	Yes
comment	<p>GM1 Article 4 Dynamic airspace reconfiguration bullet (i)</p> <p>Second sentence, statement "... or they will share live UAS traffic information with the ATC unit". ATC units cannot take into account the live information about the UAS traffic in scenarios other than emergency Delete "... or they will share live UAS traffic information with the ATC unit"</p>
response	ACCEPTED.
change to text	Yes, deleted as requested
comment	<p>GM1 Article 4 Dynamic airspace reconfiguration bullet (d)</p> <p>Although it is understandable that the U-Space Airspace should be defined where the manned aircraft are only "exceptionally", it cannot translate into dynamic airspace reconfiguration being "an exceptional event". For ATC, the more critical aspect of dynamic airspace reconfiguration is the frequency and predictability. It is suggested to reformulate here to highlight that the dynamic airspace reconfiguration should be initially assumed to be (normally) plannable and infrequent event, although not necessarily exceptional.</p>



response	NOTED. The actual GM text is already in line with the comment.
change to text	No
comment	GM1 Article 4 Dynamic airspace reconfiguration bullet (e) Add: "In the initial implementation, however, caution should be exercised in order to reduce the complexity of the dynamic airspace reconfiguration process and its implications on the ATC side. The segmentation into airspace blocks should, therefore, only be considered at the later stages of implementation."
response	PARTIALLY ACCEPTED. " "also taking into account the need to manage the complexity of the dynamic airspace reconfiguration process, which might be progressively increased at the later stages of implementation" is added at the end of the paragraph.
change to text	Yes
comment	GM1 Article 4 Dynamic airspace reconfiguration "(h) ... publish a temporary U-space airspace restriction..." Unfortunately, the wording is confusing. This is an authorisation for the manned aircraft but a restriction for the UAS. It should always be very clearly spelled out which aircraft category each text refers to in this regulation where both manned and unmanned aircraft are involved.
response	ACCEPTED. Add "for UAS"
change to text	Yes
comment	GM1 Article 4 Dynamic airspace reconfiguration (j) It should be kept in mind that VFR traffic is exempted from clearances in airspace class G and E. Therefore, ATC cannot issue clearances in these cases.
response	NOT ACCEPTED. Class G is out of the scope of DAR, which takes place in controlled airspace only. About Class E, there are two possible legal interpretations: 1) It is to be generally considered controlled airspace; if so, ATC will not apply DAR for VFR, which will eventually never be allowed to fly in a volume of airspace designated as U-space; or 2) It is to be considered controlled airspace for IFR and uncontrolled for VFR; if so, VFR will enter designated U-space without DAR, by the only requirement of e-conspicuity.
change to text	No
comment	GM1 Article 4 Dynamic airspace configuration



	<p>We propose to detail the case whenever a dynamic airspace restriction needs to be extended beyond the “end time” defined when promulgated. We are not sure the current wording provides a clear path to implementing in this specific case.</p>
response	NOTED.
change to text	No
comment	<p>GM1 Article 4(g)</p> <p>We propose to list as part of the factors to define the time margins, the coordination with the USSP on the active UAS flight plans in the area.</p>
response	NOT ACCEPTED. The paragraph covers the establishment of time margins with reference to controlled airspace design and traffic. Tactical constraints related to active UAS flight authorisations are dealt with by GM1 ATS.TR.237(b).
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>“(c) [...] It is carried out by the ATC unit in response to variable manned traffic patterns, which demand mid- or short-term U-space airspace adaptations.”</p> <p>In controlled airspaces with frequent helicopter traffic at low altitudes, this will lead to an unacceptable workload for air traffic controllers.</p>
response	NOTED. The regulatory framework proposed is meant to cater for initial operations today. Further improvement are needed at a later stage of U-space implementation.
change to text	No
comment	<p>GM1 Article 4(g)</p> <p>Add(g): A UAS operator would not be able to land if he is e.g. over a forest or a city, and would not be able to leave the airspace if he is too far from the boundary. Hence during the flight planning, the operator should plan the flight such that he is at all times able to leave the airspace timely.?</p>
response	NOT ACCEPTED. When time margins are set, the UAS operator is expected to refer to them. In such case, the U-space airspace designation process should determine whether flight authorisations can be provided exceeding those limits as, in principle, this would either imply a forced landing, or the impossibility of applying DAR.
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>How will the USSP inform the operator of dynamic airspace reconfigurations? Or does it require a link from the USSP to all UAS in the affected airspace, so that the USSP may take</p>



	control of aircrafts affected by a reconfiguration if the operator cannot be informed in time?
response	PARTIALLY ACCEPTED. The USSP will receive the U-space airspace reconfiguration from the CIS and will inform the UAS operators about this airspace restrictions. The operator will see his flight authorisation modified. Meanwhile it has been considered useful to send a preliminary alert to the operators to let them anticipate the DAR.
change to text	Yes
comment	GM1 Article 4 Dynamic airspace configuration “(f) ...should request the UAS operator already into the deactivated portion of the U-space airspace either to leave it or to land.” If landing is possible. In rural environments this is probably feasible, in an urban environment there should be alternatives. Would UAS operators be entitled to deviate from their route in case of "leave"?
response	NOTED. UAS operators are expected to adhere to updated flight authorisations, or they might elect to land according to their operating procedures. A forced landing is only envisaged when so dictated by safety reasons. Contingency plans may be part of the flight authorisation
change to text	No
comment	GM1 Article 4 Dynamic airspace configuration Communication of airspace reconfiguration between ANSP and USSP is not "as part of CIS", cf. (EU) 2021/665 Art. 1(3)(b).
response	NOTED. Data resulting from the dynamic airspace reconfiguration referred to in ATS.TR.237 are to be made available as part of the common information services in accordance with Regulation 2021/664 Art. 5 (f) 2.
change to text	No
comment	GM1 Article 4 Dynamic airspace configuration OPERATIONAL SCENARIO This procedure takes far too long. Manned aircraft should not be given clearance until it has been ensured that the airspace has been cleared of UAS. Should the same procedure apply when HEMS want to enter the airspace? Who would be liable in case that doctors do not arrive on time at the scene of an accident or patients do not get to the hospital in time?
response	NOTED. HEMS would decide whether to await a clearance or not. In such a contingency, information to USSPs would only aim to clear the area as soon as possible.
change to text	No



comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>The paragraph (c) is confusing.</p> <p>The paragraph addresses mid term and short term demands while the beginning of the AMC/GM addressed only short term changes with emergency examples. It should be clearly stated that DAR also apply to planned or non urgent demand of traffic at certain times, like in a hub. Clarify the objective of dynamic airspace reconfiguration (short term/med term, emergency or not?)</p>
response	ACCEPTED. Delete “mid- or”.
change to text	Yes
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>Point (c)</p> <p>Concept of dynamic reconfiguration: is the dynamic reconfiguration for U-Space inside controlled airspace. In the last sentence of part 9 c) it states that it is required to allow manned aircraft to fly in the U-Space ... Isn't the dynamic reconfiguration there to guarantee that the manned aircraft in controlled airspace is NOT flying in U-Space airspace, but in a temporary reconfigured 'window' of airspace, which at that time is not U-Space airspace?</p> <p>Please clarify this.</p>
response	NOTED. This is correct. While reconfigured, the airspace is no longer U-space airspace (“temporary modification of the U-space airspace by adjusting the geographical limits”)
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>Point (d)</p> <p>This sentence is not clear. The better the airspace is designed, the easier it will be for ATC units to segregate manned from unmanned aircraft in the U-space airspace. Are ATC units segregating manned from unmanned aircraft in U-space airspace?</p>
response	NOTED. ATC is segregating the U-space airspace to allow manned aircraft to enter the U-space airspace and avoid the risk of collision with unmanned aircraft
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>"Segregation assurance": to implment buffers seems reasonable in the beginning of U-Spce. Nevertheless, the role of teh military needs to be defined by teh MSs especially when referring to (EU) 2017/373.</p>



response	NOTED.
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>(d) A U-space airspace would initially be designated</p> <p>However the U-Space airspace will be designed, with or without dynamic airspace reconfiguration, the fact will be that this airspace WILL be used by police, SAR, medivac helicopters, balloons and gliders and manned aviation at private airstrips or in distress looking for a suitable place to land.</p> <p>Creating temporary means of compliance through unproven technology will result in a low adoption rate and is likely to only increase the risk as unequipped aircraft will continue to fly.</p> <p>Providing a solution that has future potential, offers additional benefits to the manned aircraft (such as weather and traffic) will significantly aid the equipment levels and adoption rate and meet the goals that EASA has set.</p>
response	NOTED. This is the objective of the regulatory framework proposed. Indeed at a later stage of implementation, the situation will be different. The first sentence is deleted.
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>(d) The better the airspace is designed, the easier it will be for ATC units to segregate manned aircraft from unmanned aircraft in the U-space airspace.</p> <p>Globally there is a trend towards moving away from segregation. Integration is key for a CONOPS to truly work, showing that unmanned operations in non-segregated airspace can be conducted in a safe way using shared standards.</p>
response	NOTED. This is correct, integration is the final goal.
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>DYNAMIC AIRSPACE RECONFIGURATION concept is unclear and wrong. It shall be included as ASM service not ATC/ATS. It shall be done by ASM personal on tactical level who has the tools, knowledge and skills to do so.</p>
response	NOT ACCEPTED. Dynamic airspace reconfiguration is not assimilated to ASM. It is a different from it even if there are some similarities.
change to text	No



comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>Article 4 c, h– The question arises as to which distance or staggering values should be adhered to here. These are to be specified uniformly by EASA.</p>
response	<p>PARTIALLY ACCEPTED. GM2 Art.4 deals with criteria to determine applicable buffers. The final decision is left to Member States through the airspace risk assessment, with reference to UAS capabilities and performance.</p>
change to text	<p>Yes, clarifications are brought to AMC/GM to Art. 3(4)</p>
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>GM1 Article 4 Dynamic airspace reconfiguration, general understanding of the operational concept</p> <p>Questions on the way to publish such set of airspace blocks. Indeed, the key point is to efficiently exchange between ATSP and USSP about blocks that are actually available to unmanned aircraft. Identification of blocks shall be done without any ambiguity. Therefore, do we have only one U-space airspace published and the subdivision in smaller blocks will be part of a bilateral arrangement, or, do we have all smaller blocks published in AIP as U-space airspaces ?</p>
response	<p>NOTED. There should be no need to publish U-space airspace blocks in the AIP, as ATC clearances would be granted by ATC taking into account the availability of such blocks, rather than making explicit reference to them in communications. Blocks shall be part of U-space common information, according to the model adopted by the Member State.</p>
change to text	<p>No</p>
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>GM1 Article 4 Dynamic airspace reconfiguration, general understanding of the operational concept, (g) + operational scenario, (i) & (j)</p> <p>A “time margin” should be defined ensuring that after this time UAS shall be outside the deactivated U-space airspace part concerned.</p> <p>Propose to add within the regulation a clear requirement to UAS operators that they have to comply with USSP revised Flight authorisation in a “Time marging” defined for the U-space airspace considered : vacate the U-space airspace concerned or discontinue their flights.</p>
response	<p>PARTIALLY ACCEPTED. However, point (g) deals with the establishment of time margins with reference to controlled airspace design and traffic. Tactical constraints related to active UAS flight authorisations are dealt with by GM1 ATS.TR.237(b). UAS operators are required to comply with the UAS flight authorisation, as well as with any changes thereto, according to Regulation 2021/664 Article 6 (6). An AMC is nevertheless created to provide a preliminary alert to the operators.</p>



change to text	Yes
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>To (c): According to Art. 2 of the U-Space Regulation, the instrument Dynamic Airspace Reconfiguration is to be applied ONLY in the case of <i>short-term</i> changes. An interpretation, that also includes mid-term changes, is not legally permissible, as it clearly contradicts the wording.</p> <p>To (e): This is not flexible enough for an efficient use of airspace. If the flight path of manned aviation is predictable, only this corridor should be closed. Note: The AMCs to Regulation (EU) 2021/665 are also more precise here. The AMCs should be uniform here.</p> <p>To (f): It should be made clear here that "to land" means a safety landing outside the airspace restriction area. An immediate landing on the spot may not be safe in every case.</p> <p>To (i): More precisely: When UAS operators are affected by Dynamic Airspace Reconfiguration, they receive a) an information via the UAS Flight Authorisation Service that their UAS flight authorisation has the status "withdrawn" and second, they receive b) an information via the Geoawareness Service about the scope (spatial and temporal) of the reconfiguration/temporary airspace restriction.</p>
response	<p>PARTIALLY ACCEPTED</p> <ol style="list-style-type: none"> 1) Agreed (by definition). Delete "mid- or" 2) This is considered the highest degree of flexibility currently achievable, pending the ability to apply tactical separation, and adequate level of UAS performances and integrity. "Tactical corridors" could be an intermediate step, somehow mirroring for manned traffic the flight authorisation concept. 3) ACCEPTED. Referred to in AMC1 ATS.TR.237(a), GM2 ATS.TR.237(a). 4) ACCEPTED – although the flight authorisation could be updated, instead of withdrawn. Anyhow, while this bullet focuses on this aspect, other AMC/GM deal with other relevant elements.
change to text	Yes, changes as indicated
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>It is suggested the replace the current paragraph (c) with the following one: The 'dynamic reconfiguration' of the U-space airspace is an important element of the overall safety argument for safe operations in the U-space airspace. It applies for a U-space airspace that is established in controlled airspace and allows manned aircraft to fly clear of the U-space airspace whilst ensuring the containment of the U Space traffic by the applied activity buffer.</p> <p>Justification: If one adapts the U Space dynamically, then the traffic for which it is adapted does not cross the U Space.</p>
response	ACCEPTED



change to text	Yes, text amended accordingly.
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>About paragraph (g), this is confusing with regard to the "short notice" in the beginning of the GM/AMC, how should this be handled. It is suggested e.g. to have one predefined "time to land".</p>
response	NOTED. The paragraph deals with the establishment of time margins with reference to controlled airspace design and traffic. Tactical constraints related to active UAS flight authorisations are dealt with by GM1 ATS.TR.237(b).
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>About paragraph (i), what does "Traffic Information" mean and what does ATC do with it?</p> <p>ICAO (Doc 4444) has defined the term "traffic information" (Information issued by an air traffic services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.). It is very unfortunate that in this document this term is constantly used incorrectly.</p>
response	ACCEPTED.
change to text	Yes, "... or they will share live UAS traffic information with the ATC unit" is deleted.
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>Some UAM operations will be performed with a pilot on board (ops type #3). The role of dynamic airspace reconfiguration should be carefully assessed and agreed with all involved parties. As such, dynamic airspace reconfiguration concept should be used as an exception and only in emergency cases, rather than on regular basis.</p> <p>Still, in order to integrate crewed and uncrewed traffic, a smart design of airspace would be needed as a short term solution. This would enable operations of both crewed and uncrewed aircrafts without the need of dynamic airspace reconfiguration. Another solution would be to enable crewed aircraft to use U-space services, what is suggested as a longer term option.</p>
response	NOTED. Will be considered during the further stages of the Drones regulatory framework evolution.
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>"(c) last sentence:</p> <p>Manned traffic will fly in the U-space outside of controlled airspace and therefore without dynamic reconfiguration. This wording suggests this would not be safe.</p>



	consider rewording.
response	ACCEPTED. Text amended accordingly.
change to text	Yes
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>Clarify if the article implies that dynamic reconfiguration uses sectors or blocks in which a U-Space airspace volume can be divided. That is, that these blocks are pre-designed and they are activated/deactivated according to ATC needs.</p> <p>Likewise, the role of military ANSPs in dynamic reconfiguration is not taken into account, as U-Space airspace may also be within controlled airspace where ATC services are provided by a military ANSP. Can military ANSPs make use of dynamic reconfiguration? This role needs to be clarified, since it is important that military ANSPs can also use this dynamic reconfiguration.</p>
response	<p>NOT ACCEPTED.</p> <p>1) correct, as guidance.</p> <p>2) No reference is made about the nature of the ANSP – whether civil or military. DAR is applicable by whomever is responsible for ATC provision in the relevant airspace.</p>
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>Those “portions of U-space airspace” must be considered during the U-space airspace design, thus strategically predefined or is it more focused as a real-time ATC application? In the former case, who will be the responsible of the strategic design of the portions/blocks?</p> <p>Is this question within the scope of the regulation, or is it more of a technical issue at the discretion of Member States?</p>
response	NOTED. As described in point (e), a strategic approach is paramount in the design phase, as ATC ability to apply DAR in a purely tactical way could be limited.
change to text	No
comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>Letter h) states that if the ATC unit initiates a dynamic reconfiguration, the U-space restriction will be published. What is the purpose of this publication and where/how should it be done?</p>
response	NOTED. The term “publish/published” is used as in Regulation 2019/947 with reference to Article 15 thereby, meaning “made publicly available”.
change to text	No



comment	GM1 Article 4 Dynamic airspace configuration reads "Operationally, the ATC unit will inform the USSPs, as part of the CIS, that certain portions...". Please rephrase to "Operationally, the ATC unit will inform the USSPs, via the CIS, that certain portions...". Otherwise you might get the impression the ATC unit is the provider of the CIS
response	PARTIALLY ACCEPTED. Reformulated, but the ATC is a provider of CIS.
change to text	Yes.

comment	GM1 Article 4 Dynamic airspace configuration (k): Why through the "geo-awareness service"? Pursuant Article 5 (1) (f) Regulation (EU) 2021/664 it is a task of the CIS.
response	NOTED. Although they are all quite similar in nature, Regulation 2021/664 Article 5 makes a clear distinction between UAS geozones / airspace restrictions, and data resulting from DAR. Amend as follows "...restriction would be lifted, the USSP may again issue or amend UAS flight authorisations for UAS operators accordingly".
change to text	No

comment	GM1 Article 4 Dynamic airspace configuration What happens to special operations in case of a dynamic airspace reconfiguration. According to Art 10.8 and annex 4, UAS special operation are also subject to a UAS flight authorization. Do they also need to leave or stop operation or can the continue their mission? How will this be managed/communicated?
response	NOTED. As segregation shall be ensured, no UAS operation is expected to take place in volumes of designated U-space airspace once they have been deactivated through DAR. However, the potential presence of UAS special operations is addressed in AMC2 ATS.TR.237(a) as a circumstance to be taken into account by ATC before applying DAR.
change to text	No

comment	GM1 Article 4 Dynamic airspace configuration The application of dynamic restrictions of U-space is not clearly described. A possibility would be to use aircraft / helicopter position to close U-space as needed. Otherwise large areas of the U-space will have to close, resulting in unnecessary reduction in capacity
response	NOTED. This is considered the highest degree of flexibility currently achievable, pending the ability to apply tactical separation. "Tactical corridors" could be an intermediate step, somehow mirroring for manned traffic the flight authorisation concept.
change to text	No



comment	GM1 Article 4 Dynamic airspace configuration OPERATIONAL SCENARIOS. Text of sub paragraph (h): Can this be fast enough and compatible with the emergency situations that are mentioned in sub paragraph (g) above?
response	NOTED. Paragraph (g) deals with the establishment of time margins with reference to controlled airspace design and traffic. The operational scenario in (h) is referred to normal operations, while an emergency scenario would call for ATC to apply DAR also without coordination, as in AMC1 ATS.TR.237(a).
change to text	No
comment	GM1 Article 4 Dynamic airspace configuration Add in the text clear references to IR 2150/2005, 2019/123 and ICAO Doc 8168 Vol II. Review GM1 to Article 4 for providing clear guidelines how to conciliate airspace requirements and management of airspace across all airspace users at the same time.
response	NOT ACCEPTED. While different airspace users' requirements are harmonised within the airspace assessment, DAR is specifically intended for ATC decision, although with a balanced approach.
change to text	No
comment	GM1 Article 4 Dynamic airspace configuration Point (e). The terms "especially when designated in controlled airspace" are useless and potentially confusing since this GM is under article 4 that is ONLY for controlled airspace. Remove the terms "especially when designated in controlled airspace"
response	ACCEPTED
change to text	Yes, as requested.
comment	GM1 Article 4 Dynamic airspace configuration Point (i) In such a description, it is noticeable that the details of the conditions for the exchange of data will be essential. Considering the well known intention of candidate USSPs to use as much as possible automation and not human operators, it would have been useful to obtain information on the conditions of e.g. "they will share live UAS traffic information with the ATC unit" that for the time being remain unclear. This impression is reinforced by the proposed AMC and GM related to Annex V, addressing very technical aspects of automatic data exchange.
response	PARTIALLY ACCEPTED. The sentence "... or they will share live UAS traffic information with the ATC unit" is deleted.
change to text	Yes, as indicated.



comment	<p>GM1 Article 4 Dynamic airspace configuration</p> <p>Regarding the last sentence of GM2 to Article 4 Dynamic airspace reconfiguration (b): "The availability of those standards and criteria would also be of use to an ATC unit for tactical application, although to a limited extent." We have trouble determining what exactly would be of use to an ATC unit on a tactical level, therefore we suggest to include some examples here, for better understanding.</p>
response	<p>NOTED. In theory, ATC might possess enough information to tactically reconfigure U-space airspace by means of buffers, analogous to those used in U-space airspace design. In practice, this would be likely to happen on the vertical plan only (e.g. lowering the upper limit of the U-space airspace as in GM2 ATS.TR.237(a).</p>
change to text	No
comment	<p>GM2 Article 4 bullet (b)</p> <p>U-space airspace design must take into account buffers, based on those standards and criteria. For reasons also mentioned above, there would be no situation in which ATC unit would use the knowledge of this at the tactical level, other than managing an emergency.</p> <p>Delete sentence "The availability of those standards and criteria would also be of use to an ATC unit for tactical application, although to a limited extent."</p>
response	ACCEPTED.
change to text	Yes, as suggested
comment	<p>Standard Development Organisations (SDOs) are developing standards for navigation performance of UAS. Among them EUROCAE for the Navigation System Error (NSE) and ISO draft 24355 for the Flight Technical Error (FTE) of the Flight Control System.</p> <p>One more sentence is necessary to clarify that States may refer to industry standards when they would be available.</p>
response	NOTED. Conventional practice when a consensus is achieved for the recognition of standard.
change to text	No
comment	<p>GM2 Article 4</p> <p>"(a)(1) [...] there is a need for performance standards for UAS — those for manned aircraft being already widely set."</p> <p>There is also a need for performance standards for legacy aircraft and legacy ATC especially in the very low level. This is not true for all possible cases of U space airspaces, but for those designated below 500 ft, legacy surveillance technologies may be impaired. ATC may be able to see drones moving in the reconfigured U space airspace, but they may have no information about legacy aircraft.</p>



response	NOTED. Separation provision between manned and unmanned traffic is not foreseen at present regulatory stage. As segregation is applied, drones are not expected to operate in U-space airspace which has been deactivated through DAR. Even when not 'visible' by means of ATS surveillance, all controlled manned traffic is expected to be known to ATC.
change to text	No
comment	GM2 Article 4, Paragraph (a)(1) Provide more specificity on acceptable performance standards for UAS.
response	PARTIALLY ACCEPTED. In the framework of Regulation 2019/947, specific capabilities and performance requirements are set in accordance with Regulation 2021/664 Article 3 (4) (a), based on the airspace risk assessment.
change to text	Yes, clarifications are added to AMC/GM to Regulation 2021/664 Article 3(4).
comment	"If the ATC unit intends to issue a clearance for a manned aircraft to enter the U-space airspace, it will initiate a dynamic airspace reconfiguration procedure and publish a temporary U-space airspace restriction as part of the common information for that U-space airspace." This must be very different depending on in which airspace it is..... If U-space is also in areas where manned aircraft operate and if it is in areas where no ATC clearance is required how shall it then be handled?
response	NOTED. While the coordination process would not be lengthy in an automated context, totally discarding any form of coordination might turn out to be operationally non-viable and, ultimately, unsafe. As UAS operators might simply be unable to comply in the desired timeframe, the option of clearing manned traffic into a volume of airspace designated as U-space without such coordination should be confined to contingencies.
change to text	No
comment	Only the information flow for operators of unmanned aircraft is described within this opinion. How will be operators of manned aircraft informed on the status of U-space airspace?
response	NOTED. In principle, manned aircraft operators are not informed about DAR application as it is intended for tactical, short-term use by ATC. While individual flights will be cleared into deactivated U-space airspace, no planning is expected to take place with reference to DAR.
change to text	No
comment	The current proposal for dynamic airspace reconfiguration requires its application every time when a crewed aircraft intends to enter U-space airspace. It needs to be noted that such concept will generate costs and also will be burdensome for the operation. Hence, as stated below in our comment on dynamic airspace reconfiguration, the concept should be used as an exception.



	Moreover, with the current proposal of the NPA, the need for e-conspicuity requirement of crewed aircraft when entering U-Space in controlled airspace is not given any more since the airspace will be reconfigured once it enters the U-space airspace.
response	NOTED. This is consistent with GM1 Article 2(6).
change to text	No

Common Information Services

comment	GM1 Article 5 A GM better detailing: the nature of the different data sets in charge of CIS, complemented with publishers (unique or multiple for each dataset), subscribers/consumers, update frequency and other minimum performances... should be envisaged. Add a GM as appropriate or elaborate further GM2 Article 5.
response	NOTED – An additional GM may be developed.
change to text	Yes

comment	GM1 Article 5 The common information is a collection of data originating mainly from three different sources. USSPs, through the terms and conditions of access to their services as well as pending and/or approved UAS flight authorisation requests.
response	ACCEPTED. text amended accordingly
change to text	Yes

comment	All AMC and GM Article 5 Interface between USSPs and AISPs providers The NPA 2021-14 does not ensure the transmission of critical safety data of U-space via AISPs. There is the need to add AISPs in the loop and to develop AMC and GM.
response	Noted. AIS providers are providers that are included in the overall picture, in particular under the ANSP umbrella.
change to text	No

comment	From the previous draft has been deleted. It is considered that it could be convenient to maintain this Guidance Material. <i>“Relevant NOTAM, Airspace Use Plans (AUPs)/Updated Airspace Use Plans (UUPs) and navigation warnings are regarded as airspace information and made available online as part of the common information services, in accordance with Annex II of Regulation (EU) 2021/664.”</i>
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response	Accepted
change to text	Yes, changed as suggested
comment	<p>GM2 Article 5</p> <p>Please consider to add GNSS service providers in subsection (b), which could provide information on the status of GNSS services to the CIS if deemed necessary.</p>
response	Accepted
change to text	Yes
comment	<p>GM2 Article 5</p> <p>This GM includes model aircraft clubs and associations on the list which exists on paragraph (c) -stakeholders which only retrieve information from the CIS, but don't provide information to CIS-. It is considered as convenient to include model aircraft and associations on the list of paragraph (b).</p>
response	Accepted
change to text	Yes
comment	<p>GM2 Article 5</p> <p>Item (b)(2) refers to 'ANSPs/ATS providers' as stakeholders to provide information to and retrieve information from the CIS. Please clarify if MET ANSPs are considered in this context to be a stakeholder to provide to and receive information from the CIS?</p>
response	Noted. MET providers may provide information to the CIS; which information or data are to be provided to which stakeholder has to be defined in the system architecture of the CIS data provision according to existing legislation.
change to text	No
comment	<p>GM2 Article 5</p> <p>This should be considered a list of potential stakeholders but neither a complete list nor the obligation of the mentioned stakeholder to establish interfaces with the CIS. The same applies for manned aircraft in point c).</p> <p>Change text of b) and c) to 'Stakeholders which are entitled to retrieve the information...'</p>
response	NOTED – This is what is meant under (a) “a variety of different stakeholders may be involved.”
change to text	No



comment	GM2 Article 5(c) Several of these stakeholders, e.g. model aircraft clubs, are not mentioned in Art. 5 (5) of IR 2021/664. On which legal grounds would they be able to retrieve information from the CIS? Restrict the list of stakeholders to those listed in Art.5(5) of the regulation.
response	Not accepted - the stakeholders mentioned need to be considered for the provision of an integrated situational awareness picture. Each data flow has to be in line with existing Regulation (e.g. Regulation (EU) 2019/ 945)
change to text	No
comment	GM2 Article 5 Should 'Military (ATS providers)' be at paragraph (b) as they can provide info to CIS?
response	NOTED. They are already listed under (6) other relevant authorities
change to text	No
comment	GM2 Article 5 (b) (6) add rescue coordination centers
response	Accepted - (text in NPA changed)
change to text	Yes, added as suggested.
comment	GM2 Article 5 The list of stakeholders in (b) and (c) and whether these should receive or share information with the CISP is not complete, perhaps the to and from ((B) and (C) sections) should be joined into a common list of stakeholders not sorted based on data flow direction.
response	NOTED. The purpose to have the distinction between the provision and the retrieval of information from the CIS, is to underline those stakeholders who may contribute to the U-space information and those who only use this information. It is important in the light of Article 5.
change to text	No
comment	The data shall be provided according to the complete service as described in ED-269. Each Member State can use its own data model as long as it based on ED-269 (for instance converting the different JSON files into a flatter structure). Refer to the to be created EASA ED-269 UASGZ test and reference system
response	NOT ACCEPTED. When such test and reference system is developed, EASA will make sure to refer to it in GM.



change to text	No
comment	The data shall be provided according to the complete service as described in ED-269. In general, is only the data model meant here, or should the data be provided according to the complete service as described in ED-269?"
response	Noted – the data should be compatible with the common unique digital format
change to text	No
comment	Who is responsible for the transfer of the data into the required format for U-SPACE (Appendix 2 to the ED-269 'MINIMUM OPERATIONAL PERFORMANCE STANDARD FOR GEOFENCING)? There is no available format on the manned traffic side and data needs to be transferred by the U-Space provider. AMC should: <ul style="list-style-type: none"> • Make sure that U-Space provider transfer the format. • Make sure that U-Space provider is responsible for the transfer of the Data provided into the appropriate format. The Format should be exchangeable with the SWIM Formats as well as the data specification that should be aligned. • Clarify Data Originator responsibilities as well as guidance for the quality assurance in the dataprocesses.
response	NOTED. The "U-space provider" is described in AMC/GM to Article 18(f).
change to text	No
comment	Does the same format apply also for UAS flight authorisation requests. If not, is there a specific format to use for these? Please clarify.
response	Noted. Member states may recommend a specific format, alternatively the format is to be agreed between USSP
change to text	No
comment	Is this format in line with the AIRM and e.g. AIXM 5.1 or 5.2 to ensure semantic interoperability between traditional ATM aeronautical information and the UTM/U-space world? Please clarify.
response	Noted. It is expected that AIXM 5.1 would be compatible between the ATM aeronautical information and U-space information but this necessitates further evidence. Under the ATM rules, the model should be interoperable with other means of data transmission
change to text	No
comment	The proposed AMC should also assure compatibility between CIS and existing ATM systems, as the ANSP/ATS are among stakeholders exchanging information with CIS providers.



response	Noted – if the single CISP is meant here, this is correct
change to text	No
comment	EN 4709-003, as, ASTM WK63418, ED-269, ASTM F3411-19 are not "open" as required by (EU) 2021/664 Annex I (1) which states that "Providers of common information services shall ensure that the information [...] is available [...] through common open [...] technologies [...]."
response	NOT ACCEPTED – The standards are originated by a recognised standardisation body.
change to text	No
comment	GM1 Art5(1)(b) CIS: if JSON is the required standard there must be a stronger message in the text. A SHALL is the appropriate expression (not "may"). To ensure interoperability and to avoid "problems in understanding" within the standard and its interpretations EASA must operate a test and reference system.
response	NOT ACCEPTED – The use of the standard is recommended. The use of "may" is adequate for a GM.
change to text	No
comment	GM1 Article 5 ATC units are sources of dynamic airspace reconfiguration information, and of the relevant traffic information (tracks, flight plans). The latter was not listed. Suggest to either list both, or just say "the ATC unit".
response	Accepted.
change to text	Yes, clarified as suggested
comment	According to one EDA MS, there is a need to link Article 5 with the SES recast. This U-space environment will generate new data model exchanges. According to what was already agreed by MS in SES recast proposal regarding CIS and availability of data: Achieving a high level of interoperability between civil and military systems to share data regarding U-space is crucial. Consequently, CIS should <u>comply with the national security and defence requirements</u> and particularly provide in an interoperable manner and for free to military authorities in charge of security, public order and defence, all relevant data
response	Partially Accepted – mentioned as a 'may'
change to text	Yes



comment	GM1 Article 5 Common information services d) In the absence of a single CIS-provider, the provision of information from e.g. NAA may lead to different and temporary digital interface solutions. A harmonized and flexible approach is welcomed for MS who will be designating single CIS. E) The flexible approach is welcomed. A single CIS (for instance a national ANSP) would likely not be acceptable in the long term in privately owned ANSP:s controlled airspace. The risk however is that this contributes to a different approach path depending on the information architecture concerning a distributed versus centralized model. Areas where a CTR is established and where a private ANSP and privately owned airport exist will likely suffer a longer implementation time before deploying a U-space airspace. Flexibility is welcomed.
response	NOTED.
change to text	No

comment	GM1 Article 5 Common information services “(d) In the absence of a single CIS provider, the common information is directly exchanged between the relevant stakeholders.” The negation of "there is a single CIS provider" is: "there are many CIS providers, or none". The regulation (EU) 2021/664 acc. to Art. 2(c) and other articles applies to "providers of common information services". Note the absence of the word "single". In certain cases, there may be a single CIS providers exclusively responsible for the common information of some U-space airspaces. But in general, there would be many CIS providers operating non-exclusively. In the regulation, there are fewer requirements on non-exclusive common information service providers, and this is a good thing: It provides a low barrier to market entry for entities only interested in sharing the information, but not otherwise taking part in operations. Of course, USSP can fulfil the role of non-exclusive common information service provider, but so can any other non-USSP entity. Only if there is no common information service provider for a given U-space airspace, would the relevant parties be forced to access the information directly in a peer-to-peer fashion.
response	PARTIALLY ACCEPTED. The ‘providers of common information services’ refers to the entities injecting information to support the U-space airspace implementation. The providers to the CIS have to adhere a common online interoperable technology, not necessarily “peer-to-peer”.
change to text	Yes, the notion of “peer-to-peer” is removed

comment	GM1 Article 5 Common information services “(c) Member States may decide to designate a dedicated entity to provide the CIS on an exclusive basis in a given U-space airspace.”
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	<p>But that does not correspond to what is written in the regulation 2021/664. It says there, that “Member States may designate a single common information service provider to supply the common information services on an exclusive basis in all or some of the U-space airspaces under their responsibility.” This means that a Member State has the possibility to designate a single provider of the common information services for some or all of the U-space airspace. This section thus allows for a monopoly position of the CISP in one Member State. If this conclusion is not intended, the text of the regulation should be adapted accordingly to avoid misunderstandings.</p>
response	<p>Noted. There is no contradiction between paragraph (c) of this GM and the Regulation. A single CIS provider may be designated to provide the common information in one, several or all U-space airspaces in a Member State.</p>
change to text	No
comment	<p>GM1 Article 5 Common information services</p> <p>“(c) ... The single CIS provider would need to be certified for the services it provides.” All CIS providers should be certified.</p>
response	<p>Not Accepted – CIS can also be provided by not certified or authoritative entities like state agencies, municipalities, nature protection authorities, etc.</p>
change to text	No
comment	<p>GM1 Article 5 Common information services</p> <p>“(e) Members States may decide to designate different single CIS providers for different U-space airspaces [...]”</p> <p>This is not in the regulation which clearly states that "member states may designate a *single* common information service provider". Delete sentence.</p>
response	<p>NOT ACCEPTED. The regulation leaves the possibility to the Member states to choose the model they wish: the centralised model (single CIS provider) OR the distributed model (without single CIS providers). The designation of a single CIS provider is per U-space airspace not per Member State.</p>
change to text	No
comment	<p>GM1 Article 5 Common information services</p> <p>“(e) [...], otherwise opting for a distributed model of common information exchange.”</p> <p>This is not in the regulation. The alternative to having a single (1) common information service provider is to have no (0) common information service providers at all, in which case the common information is by definition not exchanged [this is a bug in the regulation], or to have many (2 or more) common information service providers implying they would not be exclusively responsible [this would be the general case]. Delete sentence.</p>



response	Not Accepted. The alternative to the single CIS provider is to have multiple CIS providers (distributed model).
change to text	No
comment	<p>GM1 Article 5 Common information services</p> <p>To reduce unnecessary interfaces and responsibilities, data exchange should generally be carried out centrally via a single CIS provider in each member state. This provides all stakeholders with a quality-assured database („single source of truth“). It also reduces certifications effort.</p>
response	NOTED.
change to text	No
comment	<p>GM1 Article 5 Common information services</p> <p>It could also be the case in a Member State that for one, some, or all U-spaces more than one CIS provider will offer their service. Therefore, all CIS provider shall be certified and notified to the Agency. Therefore, the use of the term “single CIS provider” is misleading and should be replaced by “CIS provider” or "single CIS providers".</p>
response	Not Accepted. There can only be one single CIS provider per U-space airspace. Providers of CIS exist but then they are not identified as ‘single’. So there cannot be any confusion in the terminology used.
change to text	No
comment	<p>GM1 Article 5 Common information services</p> <p>This GM considers only two options: designation of a single CIS provider or no single CIS provider with the necessity for peer-to-peer communication. However, the implementing regulation does not restrict the number of CIS which would allow to have several ones per U-space. This might be very undesirable, nevertheless, this option is not yet precluded.</p> <p>Either consider all options or introduce a restriction of maximum one CIS per U-space.</p>
response	NOTED. In the case of a single CIS provider, there is only one per U-space airspace. There is also one CIS per U-space.
change to text	No
comment	<p>GM1 Article 5 Common information services</p> <p>U-SPACE ARCHITECTURE: The text says "<i>In the absence of a single CIS provider, the common information is directly exchanged between the relevant operational stakeholders in a distributed, peer-to-peer communication architecture</i>".</p> <p>Is there not a flaw somewhere in this setup, after having stressed the importance of a “single point of truth”? What about getting certainty about the accessibility, accuracy,</p>



	security and consistency of the information when this distributed architecture is not submitted to ongoing oversight? Is the certification of the different players sufficient when a problem will occur, and who will be held responsible and accountable in case of a safety occurrence?
response	Noted. All the entities that are participating to the provision of information to the CIS are certified to do so, therefore meeting the data quality requirements (e.g. ANSPs, USSPs, etc).
change to text	No
comment	GM1 Article 5(d) “In the absence of a single CIS provider, the common information is directly exchanged between the relevant operational stakeholders in a distributed, peer-to-peer communication architecture, whereby each data provider communicates with another USSP directly for sharing information.” This seems to be a new solution. Could you please provide the link to the regulation 2021/664?
response	NOTED. This has not changed. The distributed model for the provision of common information has always been an accepted approach since the adoption of the Regulation.
change to text	No
comment	GM1 Article 5(d) The text "whereby each data provider communicates with another USSP directly" gives the impression that communication is made only with USSPs whereas 3 actors were defined in paragraph (b). Suggest to replace "with another USSP directly" by "with another party directly"
response	Accepted – text reworded: ...whereby each data provider communicates with one another directly...
change to text	Yes
comment	GM1 Article 5(c) Here, “single” is assigned to CIS providers in a designated U-space airspace, not to a CIS provider in a Member State as is stated in the EU regulation 2021/664 Art. 5(6).
response	NOTED. The statement is correct.
change to text	No
comment	GM1 Article 5



	It is not clear along the Regulation, AMC/GM the role of the CIS, under which conditions the information can be retrieved/used, and what is this information to be shared... does it include operational information or is this reserved for the USSPs in their communication with the UAS Operators?
response	Noted – EASA may develop a dedicated GM when the needs will have been consolidated between U-space actors.
change to text	No
comment	GM1 Article 5 (1)(f) Common information services The current wording does not really clarify who is responsible for a dynamic airspace restriction under the ASTM standard. Is it the CIS provider or the USSP? We ask to add a clarification in the text.
response	Noted – In the U-space system, the ATC is responsible to initiate the dynamic airspace reconfiguration, the CIS and the USSP are meant to forward the information down to the operator.
change to text	No
comment	GM1 Article 5 (b) Point (b)(1) Further to the comment made on the explanatory note on the same subject, it is assumed that this GM refers to the terms "(f) static and dynamic airspace restrictions" used in article 5(1) of the regulation. Unfortunately, no guidance is provided on the meaning of "dynamic" and "static" applied to "airspace restrictions". Considering that "airspace restrictions" are notions that are defined under IR 2150/2005 (FUA) in a specific context (= ICAO P, R, D types of areas), their utilisation in a "dynamic" or "static" context cannot be understood without additional explanation. No proposal, clarification expected.
response	NOTED. The clarifications are brought in the (EU) 2021/665 and AMC/GM to Art 4.
change to text	No
comment	GM1 Article 5 The obligation of the Member State is to provide AIP(EAD) and AIP for UAS. Remember that ATC is only controlled flights, AFIS is delivered in some airports, small airport & glider sites may not have any service. Flight Information Service must be provided other places. Dynamic reconfiguration could be based on automated usage of surveillance information. USSPs only delivers UAS positions for TIS.
response	NOTED.
change to text	No
comment	GM1 Article 5



	As per definition <u>controlled zone</u> means a controlled airspace extending upwards from the surface of the Earth to a specified upper limit. CTRs are the ATC units area of responsibility (AoR). How CTRs will be external to the U-space airspace? ATC AoR should be external to the U-space airspace
response	NOTED. As U-space airspace volumes will most probably be designated in urban areas, it is likely that an airport CTR will be affected
change to text	No
comment	<p>GM1 Article 5(1)(f) Common information services</p> <p>It is stated that Member States can elect to use ASTM WK63418 to provide some or all the relevant dynamic restrictions. We suggest that the GM recommends the use of ASTM WK63418.</p> <p>Harmonization across Member States requires member states to use a common standard, and ASTM WK63418 is mature and has been developed with significant input from industry. Hence the standard should be recommended, not just suggested as an option that Member States may elect to require.</p>
response	Not Accepted – some flexibility for MS is the paradigm of the regulation
change to text	No
comment	<p>GM1 Article 5</p> <p>Wouldn't the ASTM WK63418 also be applicable for CISP to USSP communication as well, not only USSP to USSP communication? Such a solution would ensure that up-to-date airspace situational awareness would be available to all stakeholders via the CIS, not only USSPs. Please consider.</p>
response	Noted
change to text	No
comment	<p>GM1 Article 5</p> <p>The number of latency necessary for the proper functioning of air traffic services should be inversely proportional to the complexity of the interested airspace and to the forecasted crowding of U-Space.</p> <p>It could be useful to define a correspondence between the forecasted complexity of the U-Space with:</p> <ul style="list-style-type: none"> - the proximity to airports and which type of airports (Airspace class, number of runways, complexity of procedures); - the proximity to urban area or rural area; <p>It could be useful to define the significant information needed considering the environment crowding and the complexity in order to avoid overloading of communications or data exchange</p>



response	NOTED – to follow the proposal, experience with U-Space operations has to be collected; comment will be considered at a later stage
change to text	No
comment	<p>GM1 Article 5</p> <p>The maximum latency from SSR systems can be quite high (12 seconds).</p> <p>Modern ATC systems use sophisticated motion filtering and extrapolation systems to compensate the latency. Will these data be made available as well, or does every USSP extrapolate on its own?</p>
response	Noted – up to now it is not known, if USSPs are able to do so; designation of a single CISP could help to fulfil this requirement
change to text	No
comment	<p>AMC1 Article 5(2) Common information services</p> <p>AMC should differentiate between two separate events here - traffic information generation, and traffic information dissemination. While the latency for the data dissemination may be defined taking into account strictly technical parameters (e.g. inherent latency of the software, hardware and communication links), the timeline for the generation of traffic information cannot be so straightforward. Namely, one key element in the generation of the traffic information is the determination of the relevance (pertinence) of the actual or planned position of one aircraft versus the others to whom it will constitute traffic information. Where ATC is the originator of the traffic information, in most cases the human (ATCO) will be involved in the determination of pertinence, thus, in the generation of the traffic information. Therefore, latency standard figure cannot be associated with this action.</p>
response	Noted
change to text	No
comment	<p>AMC1 Article 5(2) Common information services</p> <p>France prefers the option where this value appears as indicative in the GM and not in AMC, to take into account the fact that the latency may differ depending on the safety case (the criticality of this parameter in the safety assessment) and on the business model (better latency will be more costly while not necessary safety critical for the considered U-space implementation).</p> <p>AMC : "Traffic information should be made available with a latency that is lower than that necessary for the proper functioning of the traffic information, as determined by the safety case." + GM : "Depending on the safety case, a latency value of 99% could be considered."</p>
response	ACCEPTED.



change to text	No
comment	<p>AMC1 Article 5(2) Common information services</p> <p>Q3. Latency number between 10-20 seconds could be sufficient in the short term. Other services, that are providing traffic information today, are some times as long as 30 seconds behind the actual situation. However, the systems may develop a function to provide initial information if e.g. manned aircraft, with a specific heading and altitude that will eventually interfere with the u-space airspace, at an early stage in the event scenario in order to compensate for the latter latency.</p>
response	NOTED.
change to text	No
comment	<p>AMC1 Article 5(2) Common information services</p> <p>If the CIS is part of the communication path of traffic information, then it must be allocated a fraction of the overall timeliness budget for traffic information.</p>
response	ACCEPTED. Indeed only a part of the budget is allocated to the CIS
change to text	Yes, AMC/GM to Art 3(4)
comment	<p>AMC1 Article 5(2) Common information services</p> <p>This latency is essential to define separation minima between manned and unmanned aircraft, therefore, buffers during U-space airspace design phase. As a consequence, this latency number for the distribution of traffic information data to UAS operators shall be part of the defined U-space airspace criteria before being published by the Member State.</p>
response	ACCEPTED. To be considered in the Risk Assessment
Change to text	Yes, AMC/GM to Art 3(4)
comment	<p>AMC1 Article 5(2) Common information services</p> <p>A clearer definition on the understanding and format of common traffic information should be added. Q3: Latency expression would be great but the arguments for Quality requirements should be added as well, referring to the 99% added (see also AMC1 Article 5(1)(f).</p>
response	NOTED.
change to text	No
comment	<p>AMC1 Article 5(2) Common information services</p> <p>Comment:</p>



	<p>Clarify that scheduled stops of the service for maintenance or related tasks are not included.</p> <p>Suggestion:</p> <p>Traffic information should be made available with a latency that is lower than that necessary for the proper functioning of the traffic information service, in at least 99 % of the time excluding scheduled maintenance periods.</p>
response	NOT ACCEPTED. Continuity and availability of the service needs to be ensured. Impact of maintenance period and disruption of services may be locally negotiated with the competent authority.
change to text	No
comment	<p>AMC1 Article 5(2) Common information services</p> <p>AMC1 Article 5(2) does not provide any added value the way it is currently formulated unless it is meant that it's up to each CISP or member state to define their own latency requirement/number. If so, please state that this is the case.</p>
response	PARTIALLY ACCEPTED – The goal is at term to provide a latency figure for all MS. At this stage an acceptable value has to be defined during the Risk Assessment.
change to text	Yes, incorporated in the AMC/GM to Art 3(4)
comment	<p>AMC1 Article 5(2) Common information services</p> <p>The UA position must be timestamped when emitted by the UA – and kept until it is redistributed, probably after a tracking function has normalized all inputs from all USSPs into a single output. This output shall be available 99% of the time at a 1 Hz update rate with a jitter of max. 0,3 s measured at the TIS function output.</p>
response	NOTED.
change to text	No
comment	<p>AMC1 Article 5(2) Common information services</p> <p>Please remember that the flow of information from UAS via USSP to TIS/CISP (and reverse) is a series of small delay/jitter during transmission – thus not allocatable to a single entity.</p> <p>There is a need for more specific requirements, even a tracking function could be foreseen as part of TIS. Otherwise, problems for one USSP's bandwidth provider could spoil the overall picture for everybody else.</p> <p>A tracking function would absorb the delay/jitter and even allow occasional missing updates from a UAS (by increasing position uncertainty for that UAS).</p>
response	NOTED – the tracking functionality should be further elaborated in the future



change to text	No
comment	<p>AMC1 Article 5(1)(f) - TIMELINESS</p> <p>It is not clearly understood for which process the 30 seconds apply. Does it mean the entire implementation process, i.e. from the start of the registration of changes to the receipt of this change information by the pilot? Or does it mean the maximum transmission time of new information (in case of changes) starting from the CISP to the USSP?</p>
response	Noted. The 30 seconds apply since the moment the information is available to the provider of this information to the moment it is transmitted to the UAS operator
change to text	No
comment	<p>???</p> <p>This does not correspond with the speeds and rates of climb/descent of the manned aircraft and the time needed for decision making, coordination and notification. Automation is needed for the process.</p>
response	Noted
change to text	No
comment	<p>AMC1 Article 5(2) Common information services</p> <p>1) Wording is a bit awkward: "[Something] shall be made available within [some time] of [being available]."</p> <p>2) What is the constraint for the missing 1 % of the time?</p> <p>3) Why not simply make it a hard real-time constraint?</p> <p>4) How is this measured?</p> <p>5) How is this proven?</p> <p>6) What are the consequences of missing the deadline more than 1 % of the time? "[...] Member States can elect to use ASTM WK63418 'New Specification for Service provided under UAS Traffic Management (UTM)' to provide some or all the relevant dynamic restrictions."</p>
response	PARTIALLY ACCEPTED. Wording of AMC1 Article 5(1)(f) is clarified.
change to text	Yes
comment	<p>While we understand the need to standardise, we have trouble understanding the background of these numerical values without knowing the exact source of the standard. <u>Call for a standardised approach to the use of numerical values in the AMC/GM. Such reference should always be based on analysis or already established rules, for example those for manned aviation if they apply.</u></p>
response	NOTED – further development of the regulation needs revision of the values based on real life experience



change to text	No
comment	AMC1 Article 5 (1)(f) TIMELINESS "Static" should be removed, as a stringent timeliness requirement is useless for static information. Remove "static"
response	Not accepted – if new static information is available, it should also be made available in this timeframe
change to text	No
comment	The text of the IR and subsequent AMC-GM should be amended to avoid using terms referring to already existing notions that are obviously not designed for use in a context like the U-Space airspace. This comment also applies whenever the terms "airspace restriction" are used in the document, like: -GM1 Article 10 UAS flight authorisation service -AMC1 Article 10(7) UAS flight authorisation service -GM1 Article 10 (7) UAS flight authorisation service -GM1 Article 10(10) UAS flight authorisation service
response	NOTED. However, it is not considered that the flexible use of airspace concept is fully similar to the U-space airspace restrictions approach.
change to text	No
comment	ISO is close to publish international standard 23629-9 on the overall UTM architecture. A GM should be added to this AMC2, clarifying that States, to define interfaces, may refer to such ISO 23629-5.
response	NOTED. Discussion may occur when the standard will be published.
change to text	No

UAS operators

comment	<p>Comment 1: the term 'external services' is not clear.</p> <p>Comment 2: the monitoring of service performance by UAS operators is unclear and seems unfeasible</p> <p>Comment 3: The provision of U-space services may begin before the activation confirmation and not after.</p> <p>Comment 4: The activation of the flight by UAS operators is not necessary.</p> <p>Comment 5: The contingency procedure of a UAS operators is not relevant for operations in the U-space airspace.</p> <p>Comment 6: the AMC on contingency procedure is redundant as it is already included in the regulation.</p>
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response	<p>Comment 1: ACCEPTED. The term ‘external services’ is merely meant to refer to U-space services providers as they are the ones who are providing the services to the UAS operators. As it is clear, at the level of the regulation, that it is the USSP that provides such services, the term ‘external service’ is now removed.</p> <p>Comment 2: ACCEPTED. The reference to the monitoring is removed as it is considered that taking the appropriate action is sufficient.</p> <p>Comment 3: ACCEPTED. The sentence is removed to avoid ambiguity.</p> <p>Comment 4: NOT ACCEPTED. The request of a flight authorisation and the concrete flight activation are distinct steps, potentially separated in time. (a flight may be authorised in advance, while the activation indicates concrete engagement of the operations).</p> <p>Comment 5: NOT ACCEPTED. The list of contingency situations provided in the guidance material is given as examples. The contingency procedure is a requirement in the regulation and is necessary to make the USSP aware of their capability to overcome a dangerous situation in the case they are confronted to one of the examples given.</p> <p>Comment 6: ACCEPTED. Although the purpose of the AMC on contingency procedure is to insist on the fact that the latter should be include In a contractual arrangement, it is agreed that this is implied by the regulation.</p>
change to text	YES

U-space service providers

comment	<p>GM1 Article 7(2) U-space service providers</p> <p>What does "connected environment" mean?</p>
response	<p>NOTED. A connected environment implies any digital connection meeting the requirements set by the USSP as explained in the sub-points to the GM. It is not restricted to internet-based connectivity, although a vast majority of connections between USSP and UAS operator is expected to be internet-based.</p>
change to text	No
comment	<p>GM1 Article 7 (2)(c) U-space service providers</p> <p>Questions were posted related to involvement of local authorities before a USSP can commence operations in a U-space airspace.</p>
response	<p>Partially Accepted. There may be confusion between a) the conditions for a USSP to meet certification requirements as laid out in Article 15 of the 2021/664 with b) its ability to meet the required U-space service performance requirements as laid out in Article 3(4)(c) of the 2021/664.</p> <p>A USSP is certified only once for a particular level of U-space service performance as per Article 15(1). After certification, the new AMC/GM “onboarding process” clarifies the checks that need to performed by the USSP with the performance requirement level in Article 3(4)(c), before to report starting and ceasing/restart of operations to the Competent Authority in accordance with Article 7(6).</p>



	<p>All relevant information on a particular U-space airspace must be made available in machine readable form as a Common Information Service, including the U-space service performance requirement information outlined in Article 3(4)(c). For more information on the airspace risk assessment resulting in the requirements in Article 3, pls see the AMC/GM to that Article.</p> <p>A USSP is inherently a digital service, without human decision making involved in the management of UAS operations in the U-space airspace. Therefore, there is also no “USSP personnel” that needs training on local conditions.</p> <p>Please also see the CRD related to Article 7(6) for more information on the necessary local agreements necessary before commencing operations.</p>
change to text	Yes
comment	<p>GM1 Article 7 U-space service providers</p> <p>The role of a CISP as a centralised, coordinating entity is suggested, with suggestions that CISP should be explicitly added as a (coordinating) role in the AMC/GM.</p>
response	<p>Not accepted. A single CISP is merely an aggregation of CIS information, in short a centralised information broker of unique “single-source-of-truth” -information. A Single CISP is merely routing information from several CIS sources, who are each still responsible for the origin of their CIS information.</p> <p>The regulation does not specify any coordination role by a Single CISP. For example, the decision to dynamically reconfigure U-space airspace is made by an ATSP, and not by a Single CISP. The information about the reconfiguration originates with the ATSP and is sent via the CISP to all subscribers of said information.</p>
change to text	No
comment	<p>GM1 Article 7 U-space service providers</p> <p>Paragraph (a) and (b) in GM1: AMC should specify if the competent authority can / may / must audit sub-contracted entities.</p>
response	<p>NOTED.</p> <p>A USSP is certified with the requirements laid out in Article 15. Any subcontractors to the USSP are expected to be managed by the USSP. Therefore, the competent authorities are not required to directly audit subcontracted entities.</p> <p>However, drawing on (EU) 2017/373 ATM/ANS.OR.B.015 Contracted activities:The GM has been updated with wording from the ATM/ANS.OR.B.015 to clarify that although the competent authority is not required to audit subcontracted entities, the competent authority may still need to get access to the data and evidences to support the certification of the USSP.</p>
change to text	Yes, clarification added.
comment	<p>GM1 Article 7 (b) U-space service providers</p>



	Several comments asked for clarification, whether a USSP needs to provide one, all mandatory 4 services as the NPA version of the AMC/GM suggested or all required in a U-space airspace?
response	PARTIALLY ACCEPTED. Whilst there is no explicit wording in the regulation to require the provision of all four services of a USSP, the intention of the regulation is to require a USSP to provide all four mandatory U-space services. Considering that the de facto adoption and compliance to use U-space services in U-space airspace requires that it should be very easy for UAS operators to sign up to and integrate to a USSP, the AMC has been reworded to require, that a USSP needs to provide all U-space services required by the MS for said U-space airspace (4, 5 or 6 U-space services).
change to text	Yes
comment	GM1 Article 7 (a) U-space service providers It is not clear whether the competent authority of the Member State of the principal place of business or the competent authority of the Member State where the U-space services are provided is responsible for oversight.
response	NOTED. While the framework and arrangement between MS is flexible, the competent authority for oversight may be the same as the certified competent authority.
change to text	No
comment	GM2 Article 7(2) U-space service providers It is not clear in which context such an action (UAS operator seeking "their" data from the USSP) would be justified, without creating a potential to encroach on property and legitimate business interests of USSPs and other UAS operators.
response	Noted. The U-space regulation covers most UAS operations, including operations in the Open category. A significant part or majority of drone operators in U-space airspace is expected to be performed by operators in the Open category, who are often private persons. It is normal practice for online platform owners to offer their private subscribers to download their history data in electronic form. The GM makes this recommended practice also for data generated by the UAS operator and managed by the USSP.
change to text	No
comment	AMC Article 7(2) U-space service providers Suggested adding to GM1 Article 7(2) "(c) the reception of electronic conspicuity transmissions from manned aircraft require U-space service providers to provide receiving coverage for the transmissions specified in AMC1 to SERA.6005(c)"



response	<p>Accepted.</p> <p>The requirement is specified in a new AMC to Article 11 :“U-space service providers providing Traffic Information service in U-space airspace established in uncontrolled airspace should make arrangements to have access to the conspicuity information specified in SERA.6005(c).”</p>
change to text	Yes
comment	<p>AMC2 Article 7(3) U-space service providers</p> <p>AMC2 Article 7(3) uses the term ‘contract’. In such [a] case, there’s a contractual relationship between both entities: one of them provides a service or makes an activity, and the other one pays a sum of money or gives some things. The term “agreement” or “arrangement” could be much more correct and might avoid any misunderstanding. This wording is used in other parts of the document for agreements between providers.</p> <p>Suggestion that there should be Common format for LoA between ANSP/ATS and USSP/CIS including all important details that the parts need to address, so that nothing important will be missed, and to keep all LoAs as aligned as possible to make it easier to handle for everyone involved, specially for the controllers that otherwise has to handle different U-spaces in a different manner - which increases the risk for someone to make a mistake.</p> <p>In the framework of ATSP/USSP contractual agreement to be established, it is said that “the procedures should describe clear roles and responsibilities for both parties, as defined in Article 15.2”. What is this Article 15.2 in reference as there is no relevant 15.2 in the U-space regulation ?</p> <p>It would be advisable to develop further explanation on conformance management and follow-ups of these contractual arrangements.</p>
response	<p>PARTIALLY ACCEPTED. The AMC has been shortened to require arrangements such as a Letter of Agreement instead of a contract, and an example Letter of Agreement provided as a new GM to Article 7(3).</p> <p>Several respondents suggested that an USSP could make arrangements with a CISP instead of directly with an ATSP. However, as a CISP is only foreseen to provide information and not coordination of activities, and Article 7(3) requires USSP and ATSP to “... ensure adequate coordination of activities, as well as the exchange of relevant operational data and information...”, a USSP will indeed be require to make arrangements directly with an ATSP for the coordination of activities, if serving U-space airspace established inside controlled airspace.</p> <p>The AMC2 to Article 7(3)(b)(3) stresses that the coordination procedures should also consider the requirements in Article 15.2 regarding an emergency management plan. Coordination of activities between an ATSP and USSP are of particular importance in contingency and emergency conditions of manned aircraft, unmanned aircraft or critical</p>



	U-space system components. An ATSP and USSP need to directly agree on coordination procedures in such conditions.
change to text	Yes
comment	<p>AMC1 Article 7(3) U-space service providers</p> <p>It is suggested to delete this AMC. What is the reason for the limitation to "Termination of Dynamic Airspace Reconfiguration"? In the context of the dynamic airspace reconfiguration additional arrangements in the sense of Article 7(3) between ATC and USSP will be required.</p> <p>Furthermore: "return to normal operations when dynamic reconfiguration ends". Dynamic reconfiguration is not an abnormal / non-normal operation. There is no end of the dynamic airspace reconfiguration. It may be that for a specific time there is no limitation of the U Space and the complete U Space is available, however if there is yet another TFC there is again a redefinition of the U Space, thus the dynamic aspect never ends.</p> <p>The Termination of Dynamic Airspace Reconfiguration is just one topic that needs to be addressed in the sense of "adequate coordination activities" Article 7(3) between ATC and USSP.</p>
response	Accepted. AMC1 is deleted.
change to text	Yes
comment	<p>AMC2 Article 7(3) U-space service providers</p> <p>This approach leads to different data qualities and quantities in each individual U-Space! Here, a uniform source of supply would be more desirable, which can guarantee a consistent quality, validity and topicality of the (geo)data. As a minimum, bindingly defined parameters (such as a uniform coordinate system, height reference system, data quality, topicality, standard units, etc.) would be conceivable. In addition, this approach would lead to a very high effort if the conditions are discussed contractually with each USSP individually!</p> <p>To be more specific</p>
response	Noted. However, 7(3) only deals with the arrangements between ATSP and USSP. See the AMC/GM to the respective U-space service for details on formats.
change to text	No
comment	<p>AMC2 Article 7(3) U-space service providers</p> <p>"(3) coordination procedures, which should cover at least: (i) nominal, non-nominal and emergency procedures concerning UAS operations, and contingency procedures; (ii)</p>



	<p>nominal, non-nominal and emergency procedures concerning manned aircraft relevant to operations in U-space airspace; and (iii) nominal, non-nominal and contingency procedures concerning system or services shortages and degraded level of quality of a service. The procedures should describe clear roles and responsibilities for both parties, as defined in Article 15.2; and"</p> <p>should be replaced with</p> <p>"(3) the coordination procedures between USSP and ATS Provider covering the provisions of Article 15(2) and Implementation Regulation (EU) 2021/665 ATS.OR.127 requirement. Examples of scope of data and information shared between ATS Provider and USSP for different scenarios are provided in GM1 to Article 7(3)."</p>
response	Accepted. Article 7(3) calls for coordination of activities in addition to relevant operational data and information. ATS.OR.127 only talks about information. The suggestion for cross referencing is sound, and the wording has been updated. The AMC as been clarified and complemented, and the existing content transferred to a GM.
change to text	Yes
comment	<p>AMC1 Article 7(5) U-space service providers</p> <p>References to "point c", "defined in b" and "items a and b" are unclear : do they refer to the content of the AMC itself or to the content of the related IR? Since this is an AMC, no ambiguity should remain.</p> <p>Proposal : Clarify the references.</p>
response	Accepted. Clarification provided. References to a and b of same AMC is intended.
change to text	Yes
comment	<p>AMC1 Article 7(5) U-space service providers</p> <p>The AIRM and related system wide semantic interoperability is a key requirement in the context of SWIM. The exemption proposed introduces a risk of semantic interoperability friction in terms of information integration, potentially implying the emergence of an information silo.</p> <p>Rather than excluding these requirements, it should be ensured that the AIRM is amended with U-space relevant elements following the AIRM Change Management process. Delete the exceptions</p>
response	ACCEPTED
change to text	Yes, the exceptions have been deleted.



comment	AMC1 Article 7(5) U-space service providers Can all information that needs to be exchanged among USSPs be provided in conformance with SWIM Yellow profile? It should be noted that SWIM yellow profile presents some limitation for real time exchange of critical data
response	NOTED. SWIM TI YP is regarded as sufficient to meet the performance requirements in U-space airspace.
change to text	No

comment	GM1 Article 7(6) U-space service providers The entire concept of the "cessation" of the service provision still leaves a number of questions open. Primarily, the question is about the status of the U-Space Airspace in the event of no available USSP - by definition, no UAS operation may be conducted within it without an appropriate flight authorisation from the USSP, and if no USSP is available, there would be no entity to provide an authorisation. Secondly, a one-week lead time for the announcement may be insufficient for proper operational planning - any suggestion of the lead-time should be given as a separate guidance, with the appropriate rationale, and not included as a template item. Finally, the ultimate question remains on the achievement of the objectives of the U-Space Airspace - namely, a U-Space Airspace may and should be designated based on the risk assessment, and should result in the sufficient mitigation of the identified aviation and non-aviation risks (such as security, privacy and so on). Cessation of service by a USSP may endanger the mitigation of the risks identified for a given airspace that had, in the first place, lead to the designation of the U-Space airspace. MSs need more stable instruments to manage the risks and to impose the commitment of the USSPs. EASA is invited to provide AMC and GM on the issues elaborated in the Remark.
response	Partially accepted.
change to text	Yes. GM1 Article 7(6) and AMC(1) Article 7(6) are added to clarify the on boarding process of a USSP in a U-space airspace. The time for the announcement of starting or ceasing operations has been updated.

comment	GM1 Article 7(2) U-space service providers Regulation (EU) 2021/664 assumes that U-space is a connected environment and therefore:(a) U-space information is exchanged in a machine-readable format to support the necessary exchange of data among relevant U-space actors; and...
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	<p>If data/information is to be exchanged within different U-Spaces (e.g. in border areas), then the "machine-readable format" should generally be defined uniformly, otherwise this could lead e.g. to different height reference systems, coordinate systems and differences in data quality. This complicates the idea of harmonious data exchange!</p> <p>refer to the to be created EASA ED-269 UASGZ test and reference system</p>
response	Noted. The AMC/GM cannot refer to yet unpublished standards, and not all information exchange needs are expected to be covered by ED-269, but the AMC/GM working group follows the standards development with great interest.
change to text	No

comment	<p>GM1 Article 7(2)</p> <p>Regarding point (b) of this GM, we have trouble determining the situation when the delivery of the U-space services in U-space would not be required, and in effect the connection of the UAS operator with USSP would not have to be established. At the moment there are already 4 mandatory services in the U-space airspace, therefore the connection is always mandatory. For that reason we find point (b) redundant and misleading. We suggest changing this point as per below proposal.</p> <p><u>Amendment proposal:</u></p> <p>(b) operations in U-space airspace require the UAS operator to establish a connection to a USSP whenever the delivery of a U-space service is required.</p>
response	Accepted. Several U-space services, such as Network Identification and Conformance Monitoring are only necessary for the in-flight phase. During flight preparation and post-flight phases, continuous connectivity between UAS operator and USSP may not be necessary as explained for example in GM1 Article 6 UAS operators (c). However the text can be misleading and is removed
change to text	Yes, as suggested

comment	<p>AMC1 Article 7(2)</p> <p>What are the definitions of : <i>Deviation thresholds</i> and <i>airspace boundaries</i> in this context. Please clarify.</p>
response	<p>Partially Accepted. Deviation thresholds: the extra volume added to the flight authorisation, ensuring that the UAS flight is separated enough from the other UAS.</p> <p>Airspace boundaries refer for example to no-photo areas or other geospatial constructs where a permission for a UAV to enter or permission to execute certain tasks are restricted. The obligation is only to inform the UAS operator of such conditions, and not to control compliance or require information of required permits.</p>



response	NOTED. SWIM TI YP is regarded as sufficient to meet the performance requirements in U-space airspace.
change to text	Yes, AMC merged with the AMC/GM to Art 10.
comment	GM2 Article 7(2) It introduces another service which require further specification in order to work properly for Member State and authorities.
response	Noted. U-space regulation also covers operations in the Open category. As such a significant part or majority of drone operators in U-space airspace will be performed by operators in the open category, who are often private persons. it is normal practice for platform owners to offer their subscribers to download their history data in electronic form. The GM makes this recommended practice also for data generated by the UAS operator and managed by the USSP.
change to text	No
comment	New AMC for Article 7 A new AMC is necessary to Article 7, etsabliishing the general principle that Authirities may credit possible industry certifications. This principle already exist in AIR-OPS (Reg 9265/2012).
response	NOT ACCEPTED. This generic principle is true, while remaining the prerogative of the competent authority to decide whether to use it.
change to text	No
comment	GM1 Article 7 and GM1 Article 14(c) (c): According to GM1 Article 7 and GM1 Article 14 item (c), USSP certificate is valid across Europe and confirms that USSP meets the requirements commensurate with the risk associated with the U-space service they provide. And the risk associated with the U-space service is defined by the U-space airspace risk assessment conducted at state level by the Member State. To achieve the certificate recognition across the Europe Union and ensure that a certified USSP can meet the safety objective defined by the airspace risk assessment (cf. GM3 Article 3(1) items (6)(iv) and (c)(4)) , the airspace risk assessment needs to use a defined and harmonised methodology, harmonised definition of severities and associated safety objectives classification schemes. Indeed, as U-Space services performances and data quality (accuracy, resolution, integrity, traceability, timeliness, completeness and logical consistency) are derived from the airspace risk assessment, harmonisation of risk assessment methodology, definition of



	severities and associated safety objectives classification schemes is an enabler of certificate recognition.
response	NOTED. The AMC/GM to Article 3(4) have been added.
change to text	No
comment	<p>GM1 Article 7(2)</p> <p>Regarding point (b) of this GM, we have trouble determining the situation when the delivery of the U-space services in U-space would not be required, and in effect the connection of the UAS operator with USSP would not have to be established. At the moment there are already 4 mandatory services in the U-space airspace, therefore the connection is always mandatory. For that reason we find point (b) redundant and misleading. We suggest changing this point as per below proposal.</p> <p><u>Amendment proposal:</u> (b) operations in U-space airspace require the UAS operator to establish a connection to a USSP whenever the delivery of a U-space service is required.</p>
response	ACCEPTED
change to text	Yes, as suggested
comment	<p>GM1 Article 7 U-space service providers</p> <p>This GM provides guidance on how U-Space services are provided by the U-Space Service Providers (USSP), but it does not address the provision of the so-called external services. It would be required to clarify (in this section or elsewhere in the NPA):</p> <ol style="list-style-type: none"> 1) What are exactly 'external services' (i.e. definition) and why they are different (or not) to U-Space services 2) Whether a external service can be provided to UAS operators directly or through a USSP. It is recalled that providers of external services are not covered by the U-Space regulation. 3) What kind of agreements have to be concluded between the external service provider and the USSP and/or UAS operator 4) Whether external service providers are subject to any kind of certification or verification by the aviation authorities (and the legal basis under which this certification/verification is done).
response	Not accepted. This AMC/GM focuses on clarifying the (EU) 2021/664, 665 and 666. 2021/664 briefly mentions “other U-space services” in Recitals (23). It is understood, that U-space service outside the U-space airspace regulation is subject to a free market regime.
change to text	No



comment	U-space service providers should provide their services to support the safe, secure, and efficient operations of aircraft in the U-space airspace and ensure coordination with the relevant ANSPs, or the CISP if exists , so that manned aircraft movements are safe and efficient.
response	Not accepted. A CISP is merely an aggregation of CIS information. The regulation does not foresee any coordination to take place inside a CISP, such as negotiating traffic. The manager of manned air traffic is the ATSP. That the information on relevant manned air operations is routed via a CISP does not change that the USSP needs to coordinate with the ATSP.
change to text	No

comment	<p>GM1 Article 7 U-space service providers</p> <p>GM1 Article 7 U-space service providers bullet (b)</p> <p>GM states "the four mandatory U-space services as listed in Chapter IV of the Regulation (EU) 2021/664", overlooking the fact that a MS may require a service that is optional as per the IR to be mandatory in the given airspace, in which case the USSP must be capable of providing all services mandatory in the given airspace. Suggested Solution: Delete "four" and delete "as listed in Chapter IV..." till the end of the sentence.</p> <p>GM1 Article 7 U-space service providers bullet (c)</p> <p>What is suggested in the bullet (c) of this GM does not appear to be permissible under the IR. It, actually, materially contradicts the legal requirements of the Regulation that the certificate is issued on the basis of the capability of USSP to meet the performance requirements for a specific U-Space Airspace, whereby, by implication, the same USSP may not be able to meet the performance requirements of another U-Space Airspace. This does not exclude the possibility that two or more MS define the same USS performance requirements, thus enabling the USSP certified in one MS to provide USS in another MS, without a need for some additional certification.</p> <p>Suggested Solution: EASA is invited to reformulate this bullet, and to explain in the GM the relationship between the certificate and the performance requirements specific to a given U-Space airspace.</p>
response	<p>PARTIALLY ACCEPTED.</p> <p>1) The set of required services is raised at AMC level and clarified in a new AMC1 to Article 7(2).</p> <p>2) Certification and satisfaction of the performances requirements are coupled, indeed complementary evaluations may need to be undertaken in a new U-space. Clarified in AMC1 to Article 7(6)</p>
change to text	Yes, new AMC1 Article 7(2). And AMC1 Article 7(6).



comment	<p>Fairness is closely related to efficiency of airspace management and operations, as well: in general, when multiple stakeholders choose to cooperate, all users realize the benefits of more efficient operations. IFATCA believes a useful framework for identifying, describing and quantifying fairness-related problems, while remaining agnostic as to how best to approach their solutions needs to be provided. Quantifying fairness is inherently difficult, because up until now it has been tied closely with other metrics, such as those related to airspace efficiency or auction practices.</p> <p>Defining metrics for fairness are particularly challenging because fairness may be perceived differently by different stakeholders.</p> <p>IFATCA also suggests that prioritization could be used to incentivize desired policy outcomes, such as minimizing safety risks or reducing negative environmental impacts. This could be achieved by giving higher priority to safer, quieter or greener vehicles. The goal of fairness may therefore need to be balanced with other desired policy outcomes.</p> <p>It is important to note that there are also tradeoffs between fairness and other metrics, including efficiency, predictability, flexibility, and safety. Further metrics can then be calculated, which assumes we can quantitatively compare operator utilities, and the price of fairness. The price of fairness is significant because it quantifies the degradation of other metrics (e.g., safety, efficiency) by imposing fairness.</p> <p>The distribution of costs across operators could be evaluated to quantify fairness. Other metrics, which are more complex, is based on the assumption that a “first-come, first-served allocation” is fair. However, the traditional definition based on scheduled arrival times may not be relevant to the on-demand operations supported by UTM, while basing it on when operational intent is requested has been shown to have significant negative implications for fairness.</p> <p>There is a clear need to study and evaluate the implications of the UTM architecture on fairness, even at this relatively early point where complex implementations don’t yet exist</p>
response	<p>NOTED. Fairness and non-discriminatory approaches are the basis of the EU regulations. The items are noted and might support refinement of criteria in the future.</p>
change to text	<p>No</p>

comment

GM1 Article 7

In GM1 Article 7 U-space service providers of NPA 2021/14 it is clearly stated that the USSP must demonstrate capability of providing the four mandatory U-space services in order to be granted the certification.

However, if any of the two optional U-space services are required by the MS in a particular U-space airspace, does the USSP intended to operate in that U-space be certified for the four mandatory services and the additional service(s) required as well? Could those additional services be provided by an independent certified USSP?



response	NOTED. The USSP should provide bundle of services. It may encompass 4, 5 or 6 services. The services should not be provided independently. This approach is clarified in a new AMC.
change to text	Yes
comment	GM1 Article 7 U-Space service providers USSPs should ensure coordination with the CISP.
response	Not accepted. The USSP will need to establish coordination procedures with the ANSP when U-space airspace is located in controlled airspace for nominal, non-nominal and emergency conditions, as explained in AMC2 Article 7(3) (b)(3). The regulation does not expect a CISP to have any coordinating or managing role.
change to text	No
comment	Member States should continue to have sovereignty over their airspace, as is also stated in GM1 Article 3. Therefore, they should also have the freedom to select USSPs for their U-space airspace.
response	Not accepted. The position does not comply with the Regulation 2021/664. The MS do not select the USSP. The USSP are free to provide services provided they demonstrate they satisfy the performance requirements of the U-space airspace.
change to text	No
comment	AMC2 Article 7(3) U-space service providers (a) Shouldn't this contract be a Letter of Agreement?
response	Accepted. The AMC is reworded and a new GM provided.
change to text	Yes, as suggested
comment	AMC2 Article 7(3) CONTRACTUAL ARRANGEMENTS BETWEEN THE USSP AND THE ATS PROVIDER Remark: While the Regulation indeed requires the arrangements for the exchange of operationally relevant data, the AMC/GM interprets that in its most rudimentary and inefficient model - point to point contractual framework. In the ATM, the point-to-point contractual framework (Letters of Agreement) is justified given that the ATC units are monopolistic organisations, act as unique service provider



	<p>within their respective areas of responsibility, and need to cater for an extensive human-to-human time critical exchange of data.</p> <p>U-Space framework, on the other hand, allows (encourages) the possibility of multiple (numerous) service providers operating within the same airspace, whereas the same information to be delivered by the ATS may be relevant for all or most of USSPs operating within the given U-Space Airspace. It is, therefore, questionable why a point-to-point data exchange between ATSP and a USSP would be required (or even desirable), where a lot more efficient method of network distribution through CIS could fulfil the functional requirements of the Regulation in a lot more efficient and technologically advanced manner.</p> <p>In such a framework, ATS unit would deliver all required data to CIS, making them thus available to all USSPs active in the area, for their consideration. The same would work in the opposite sense, where USSPs would deliver data to CIS, thus making them available to other USSPs and ATS units. It would, on one hand, improve the data quality and integrity and, on the other, provide significant savings in administrative and technical tasks.</p> <p>Suggested Solution: EASA is invited to thoroughly re-think the concept of coordination and exchange of data ATSP-USSP to permit diverse functional architectures and diverse technical solutions for the same functional objective of the Regulation.</p>
response	PARTIALLY ACCEPTED. The AMC is reworded and a new GM provided. However, CIS and CISP in the regulation is limited to information exchange. Delegation of coordination activities from ATSP to CIS or CISP is not covered by the regulation.
change to text	Yes, AMC/GM reworked
comment	<p>AMC2 Article 7(3)(b)(3) CONTRACTUAL ARRANGEMENTS BETWEEN THE USSP AND THE ATS PROVIDER</p> <p>In the framework of ATSP/USSP contractual agreement to be established, it is said that “the procedures should describe clear roles and responsibilities for both parties, as defined in Article 15.2”. What is this Article 15.2 in reference as there is no relevant 15.2 in the U-space regulation ?</p>
response	NOTED. AMC2 to Article 7(3)(b)(3) stresses that the coordination procedures should also consider the requirements in Article 15.2 regarding an emergency management plan.
change to text	No
comment	



	<p>It seems there should be complementary to that provided by the CIS P as long as it does refer to CIS an, implicitly, to the CIS P when it exists.</p>
response	<p>Not accepted. The nature of the CIS service indicated does not change if it is provided directly by the ATSP or via a single CISP. A Single CISP is regarded as an aggregator of CIS information and routing entity only. A CISP is not foreseen to have any coordinating role.</p>
change to text	<p>No</p>

comment	<p>GM2 Article 7(3)</p> <p>It is unclear to us, which other TFC info can an ATSP directly provide to USSP, except of <i>“the relevant traffic information regarding manned aircraft that is necessary as part of the CIS”</i>? We assume that also a USSP could provide the UAS TFC info to the ATSP via a CISP. If there is a single CISP designated, there is no need for a distributed U-space architecture.</p>
response	<p>Noted. The examples illustrate, that an ATSP at its discretion may provide for example traffic information for a larger volume of airspace than strictly necessary for safety reasons. This can technically be implemented through the same interfaces at CIS TIS, but conceptually CIS data is limited to the requirements in the regulation. It is possible, but not required, for USSP to provide UAS traffic information data to ATSP using the same CIS interface. However, such data is not classified as CIS data, as there is no requirement in the regulation for a USSP to share traffic data with an ATSP. A USSP only has to share relevant (and not necessarily all) UAS traffic information data with another USSP.</p>
change to text	<p>No</p>

U-space services

A. Network identification service

comment	<p>GM1 Article 8 GENERAL bullet (a)</p> <ul style="list-style-type: none"> • "Heading" may be a questionable concept for a quadcopter. Suggested Solution: Replace the term "heading" with the term "intended track".
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- "Height" may be insufficient data for ATC purposes. The exact requirement should be defined as an element of UAS performance, per U-Space Airspace. Suggested Solution: Use a more generic term "level" to also encompass "altitude".
- Reference is made here to ASTM standard F3411-19: Tough, the data format of this standard does not accommodate the data fields required by 2021/664 on network remote-id. Below the delta's are illustrated for between the U-space regulation and the F3411 standard. (MSL is not mentioned as it not part of ANY standard, only Uspace legislation)
 - Geodetic altitude :
 - Uspace : ref AMSL
 - ASTM : ref WGS84
 - Height (above TakeOff)
 - Uspace : Mandatory
 - ASTM: Optional
 - Operator Registration Number :
 - Uspace : Mandatory
 - ASTM : NA

response PARTIALLY ACCEPTED

- "heading" replaced with "route course"
- "height" replaced with "flight level".
- "USSPs would need convert the WGS84 exchanged with F3411-19 to MSL before displaying it to the user.", is added.

change to text YES, as indicated

comment **GM1 Article 8 : Confusion between the two Remote identification mechanisms (945 and 664)**

- Clarify the link between UAS capabilities (as specified by EU 2019/945) and "network identification service" provided by the USSP.
- Explain the difference in more detail and provide solutions on how the network remote ID signal could reach the USSPs?

response ACCEPTED. The link is clarified.

change to text Yes

comment **GM1 Article 8 Sharing data via CISP**

- GM1 should read "USSPs share and consolidate UAS flight data between themselves (and with the single CISP where applicable) and can, therefore, support traffic information when needed"



	<ul style="list-style-type: none"> AMC1 Article 8(1) first sentence should read: "USSPs should exchange network remote identification data with all the service providers in geographic proximity (or with the single CISP where applicable)." <p>Annex 4 to ASTM F3411-19 details the communication between USSPs through DSS. When talking about the data exchange interface between USSPs, the NPA should mention the possibility of exchanging that information through CIS platform, acting the CIS in a similar way to DSS in interUSS platform model. In the short term, the use of this multi-ussp architecture (USSP-CISP-USSP) will facilitate the deployment of U-space.</p>
response	NOT ACCEPTED Even if not prohibited, per the regulation the CIS is not intended to support the inter USSP exchange
change to text	Yes
comment	<p>AMC1 Article 8(1) Geographic proximity</p> <ul style="list-style-type: none"> The term used "geographic proximity" could create confusion. We understand that, here, we talk about the U-space airspace where (multiple) USSPs provide services at the same time. Thus, the terms used should be more specific. We propose "with all the service providers in the U-space airspace concerned". Criteria for proximity need to be defined in the USS performance requirements for the given U-space airspace. Add, at the end of the first sentence, "whereas the proximity is the parameter defined in the USS performance requirements for the given U-Space airspace".
response	ACCEPTED. The AMC is clarified, and a GM is added to clarify the term 'geographic proximity'. Meanwhile AMC/GM have been developed to Art 3(4).
change to text	YES
comment	<p>GM1 Article 8(3) Update frequency</p> <ul style="list-style-type: none"> The proposed 99% value appears risky. It should either be changed to at least 99,9% or accompanied by a maximum transmission gap length. <p>As written in the proposal, a UAS may legally be non-transmitting for 36 seconds per hour (1%), during which it or an approaching aircraft at 120 knots travels more than 1 NM. This does not appear safe. We suggest a maximum allowed gap between transmissions of 5 seconds.</p> <ul style="list-style-type: none"> We consider that GM1 (update frequency) should be reviewed in the case a latency figure is included in AMC2 to Article 8(1). Latency and update frequency are interrelated (e.g. if latency is larger than the update frequency we have idle data to process with no end use) and therefore the update frequency value may need to be adapted once a latency data is defined. To avoid any misunderstanding, it should be clarified that the "update frequency" depends on multiple elements not controlled by the U-space platforms.



response	PARTIALLY ACCEPTED.
change to text	YES, text is amended
comment	<p><u>AMC3 Article 8 (1) (b) Flight / end of flight</u></p> <ul style="list-style-type: none"> • Definition of “end its flight”: does a battery change, taking up to for instance 15 minutes, also mean the end of a flight? • It is not absolutely clear what "the flight" means in the context of a flight authorisation. Is it every single flight in the context of one authorisation, or is only one take-off and landing possible within one flight authorisation? • It is unclear how it is recognized a flight has been ended. There will be cases where a flight authorization may cover a flight with several technical intermediate landings and still it is to be considered as one flight. It is suggested to use "when the operator deactivates the flight authorization" instead, which would be similar to the current flight termination after landing (FPL closure, ARR MSG). • The end of the flight should in the best case be confirmed by the UAS operator (similar to the activation request). So: An obligation of a deactivation of the flight should be required in the AMC.
response	PARTIALLY ACCEPTED. The AMC refers appropriately to flight activation. Nevertheless, the scenarios hint in the comments, has been addressed in the AMC/GM to Art 6.
change to text	YES, clarifications brought to AMC to Art. 6.
comment	<p><u>AMC1 Article 8(2) Shared data</u></p> <ul style="list-style-type: none"> • More information on what information could be provided to authorised users as defined in article 8(4) item (a) (General public) is needed • Only b, c, d items are mentioned (USSPs, ATSPs, CISP). It remains unclear which protocol is to be used for the authorities to receive the NRID data. • Why is this AMC1 limited to the named users? <p>In addition, it should be clarified which information should be provided to each authorised user in order to maintain the safety but also the privacy of the operations.</p>
response	ACCEPTED.
change to text	YES. The text is amended.

B. Geo-awareness service

comment	<p><u>GM1 Art. 9 : Confusion between the two-geo-awareness (2019/945 and 2021/664)</u></p> <ul style="list-style-type: none"> • To avoid confusion it would probably make sense to specify further the difference between the Geo-awareness service defined in Article 9 of the U-Space Regulation and the Geo-Awareness function of the UAS class markings.
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	<ul style="list-style-type: none"> For the GM, it is recommended to give more explanation about the difference in two meanings of the "geo-awareness". It would be helpful if at this point the difference between the functions were presented instead of just mentioning that there is a difference.
response	ACCEPTED.
change to text	YES. (a) is clarified.

comment	<p><u>AMC1 art. 9(1) Data quality</u></p> <ul style="list-style-type: none"> the USSP cannot guarantee for the geoawareness information as he is first only a assembler and of data and second has nothing to do with the CIS-function. The MS is responsible for the provision this kind of information for the geoawareness function of the UAS. The geo-information data may likely come from other (state or other) organisations. The USSP needs to ensure that the organisation providing the data is ensuring the integrity of the 'original' data (SLA). The source data and the organisation providing it may therefore require validation of some sort. USSP is able to perform a quality check of the information received against the standard but cannot assess the integrity of the content itself. The USSP can only ensure that all data provided by the common information services is displayed. It is not possible to check if CIS is providing all available geodata. The responsibility for this should not (and cannot) lie with the USSP, but with those actors who generate the information (CIS providers) or, if applicable, still the one who extracts it (SCISP).
response	ACCEPTED.
change to text	YES. (a) is amended accordingly.

comment	<p><u>AMC2 Art. 9(1): Feedback</u></p> <p>Presumably, there will be a lot of feedback from users to the USSP, so it should be ensured that feedback from the USSP to the CISP is filtered in advance by the USSP. Otherwise, it will be very difficult for the CISP to distinguish official changes from simple user requests.</p>
response	ACCEPTED. The feedback is relevant for all data received from the CIS. The common information service provider(s) may suggest categories that the USSPs can use to categorize the type of feedbacks that they share. Those categories may be inspired by data quality requirements such accuracy, timeliness or completeness, and offer specific tags for user comments or requests.
change to text	YES. A new GM to Art.5 is added.

comment **GM1 Art.9(2): Urgent vs non-urgent**



	<ul style="list-style-type: none"> The concept of urgent and non-urgent dynamic airspace restriction is new. Explain What are the criteria to decide whether an airspace restriction is urgent or not? The distinction between non-urgent and urgent dynamic airspace restriction should be skipped - who should decide on the urgency and based on which criteria? GM1 Article 9(2) What is the intrinsic difference between “urgent” and “non-urgent”? It is based on assumption of priority?
response	NOTED. The table is amended. “Non-urgent dynamic airspace restriction” is replaced with “Planned dynamic airspace restrictions” and “Urgent dynamic airspace restriction” is replaced with “Unplanned short-term dynamic airspace restrictions”
change to text	YES.

C. UAS flight authorisation service

comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>Please define what you mean with "coordinate". Is it e.g. enough if the ANSP has means to monitor UAS traffic?</p>
response	PARTIALLY ACCEPTED. The original text was an unexplained reference to the possibility that a flight would pass from U-space airspace into a region under control of ATC. For example, a flight from an urban area to an airport. This proposal is now considered beyond the scope of the regulation and the reference to coordination with ATC has been removed from the AMC/GM
change to text	Yes

comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>The terminology used when talking about UAS Flight Authorization Request is not aligned with the one used in 947. In 947 the Flight Plan is compound of the Flight Geography, the Contingency volume, and the operational volume. In 664, the terms used are: UAS Flight Authorization Request, Deviation Threshold and UAS Flight Authorization. It is suggested to develop a graphic depicting each of these terms.</p>
response	PARTIALLY ACCEPTED. The AMC/GM regarding Deviation Thresholds has been significantly revised based on this suggestion and a number of others.
change to text	Yes



comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>bullet (d) Remark: This bullet is in conceptual contradiction with the Regulation. USSP will issue a flight authorisation exclusively within the active U-space airspace. U-Space airspace, if overlapping with the controlled airspace, will only be active if "released" (dynamically reconfigured) by the ATC unit. Consequently, a UAS operation cannot be simultaneously subject to an authorisation by the USSP and by the ANSP. USSP authorisation may be relevant for the ANSP only in the context of the exchange of operationally relevant data (e.g. for the purpose of the provision of traffic information service), in scenarios where an active U-Space airspace is adjoining the controlled airspace.</p> <p>bullet (f) Remark: "When there is more than one USSP providing U-space services in a U-space airspace, all USSPs are obliged..."</p>
response	PARTIALLY CCEPTED. The original text was an unexplained reference to the possibility that a flight would pass from U-space airspace into a region under control of ATC. For example a flight from an urban area to an airport. This proposal is now considered beyond the scope of the regulation and the reference to coordination with ATC has been removed from the AMC/GM.
change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>Not clear if the reference to art. 15(1) in 2019/947 is correct. D) Ad "in controlled airspace".</p>
response	PARTIALLY CCEPTED. T The text has been revised following this comment and others. It should now be clearer.
change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>There are no such two kinds of identification, only network and direct remote identifications (NRID Reg.U-space+DRID Reg.945).</p>
response	ACCEPTED. The sentence has been clarified.
change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p>



	<p>The issuing of clearances in controlled airspaces is a sovereign task. According to SERA.8005, ATC is responsible in controlled airspaces. Accordingly, only ATC can issue clearances. This task cannot be delegated to the privately operating USSPs</p>
response	<p>NOT ACCEPTED. The U-space is segregated from the controlled airspace, and the operations are not placed under the controlled of the ATC. As per the 2021/664 the USSP are entitled to provide flight authorisation.</p>
change to text	<p>No</p>
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>“Activated, Withdrawn, Ended.” How is the order to be established beyond doubt? Of course, one could use the timestamps as a guideline. But what happens if UAS flight authorisation requests are received by the respective USSP at exactly the same time? Which is quite possible if the applications are received on different servers.</p>
response	<p>NOTED. The regulation should lead to a practical implementation. The AMC/GM on article 10(6) describing the “proper arrangements” has been revised to deal with such cases in a pragmatic way.</p>
change to text	<p>No</p>
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>Which data from the UAS flight authorisation requests should be allowed to be passed on? Is the 4D volume and the unique authorisation number sufficient? When sharing data, it should be considered that a USSP competitor may have a strong interest in poaching customers from the competition.</p>
response	<p>PARTIALLY ACCEPTED. The problem of how to detect conflicts while best preserving commercial secrecy has been the driving requirement behind the standard ASTM F3548-21 which is now mentioned in the revised AMC/GM for article 10(6) on the proper arrangements between USSP.</p>
change to text	<p>Yes</p>
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>Point (c): does a(ny) U-space have to be divided into volumes? See also our comment on GM1 Article 4 (e).</p>



response	NOTED. The 4D volumes mentioned in GM1 to article 10 are the 4D volumes expected in the flight authorisation request.
change to text	No
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>d) it is a new aspect that a flight authorisation has to be coordinated with the ANSP. We have the understanding that a flight authorisation is granted if no other operation intersects with the request. What is the role of the ANSP here?</p>
response	ACCEPTED. The original text was an unexplained reference to the possibility that a flight would pass from U-space airspace into a region under control of ATC. For example a flight from an urban area to an airport. This proposal is now considered beyond the scope of the regulation and the reference to coordination with ATC has been removed from the AMC/GM.
change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>GM1 Article 10 UAS flight authorisation service – (pg. 65). f) “...all USSPs are obliged to exchange the UAS flight authorisation requests between themselves as well as state changes of those requests – Activated, Withdrawn, Ended.” -></p> <p>1) Before ‘Activated’, another states should be added:</p> <ul style="list-style-type: none"> - 'pending' (submitted or filed request); - 'accepted' (from this time the 4D area is blocked against other later filed requests). <p>2) it is suggested that the status ‘accepted’ would be shared with CISP, so that other USSPs and ATSPs can make that plan visible and apply priorities against possible later requests.</p>
response	Not Accepted. The regulation does not mention that the CIS is involved in the process of flight request authorisation. Article 10(6) requires that the “U-space service providers shall establish proper arrangements...”
change to text	No
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>"Under (f) it is stated that ""this service enforces the prioritisation rules"" which are not sufficiently defined in the regulation.</p> <p>Further it says, ""all USSPs are obliged to exchange flight authorisation requests between themselves""; this could alternatively be done via the CISP."</p>
response	Accepted. The AMC/GM for 10(8) and 10(9) have been revised to clarify the prioritisation rules.



change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>(c) It seems that when USSP provide flight authorisation it encompass the constraints/authorisations defined for the UAS geographical zone attached to the U-space airspace concerned.</p> <p>By definition, a U-space airspace is “attached” to a specific UAS geographical zone. But, some UAS geographical zones overlap some other UAS geographical zones. If the U-space airspace is active in this overlapping area, the constraints/authorisations in place for the both (or more) UAS geographical zones shall be considered when providing flight authorisation. Therefore, this should be better reflected in the text. We propose : <i>“This service covers the flight authorisation provided according to article 15(1) of Regulation (EU) 2019/947, for each and every UAS geographical zones concerned when overlapping;...”</i></p>
response	PARTIALLY ACCEPTED. The overlapping of UAS geo-zones has been considered in the AMC/GM.
change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>ANSP should be involved in flight authorisation provision only within UAS geographical zone it manages. In order to avoid confusion we propose to write : “When needed, the USSP is expected to coordinate the flight authorisation with the ANSP concerned and is ...”</p>
response	PARTIALLY ACCEPTED. The ANSP are not involved. This proposal is now considered beyond the scope of the regulation and the reference to coordination with ATC has been removed from the AMC/GM
change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>e): when required refers to "when required by the CAA"?</p>
response	NOTED. The “optionality” of the Conformance Monitoring and Weather Info services depends on the competent authority.
change to text	No
comment	<p>GM1 Article 10 UAS flight authorisation service</p>



	At least with regard to the flight authorisation service, the provision of multiple flight authorisation service providers in the same U-Space airspace would lead to conflict situations due to simultaneous applications which could have an impact on safety. Therefore, GM1 Article 10 (f) should be deleted.
response	NOT ACCEPTED. The regulation requires that U-space service provision is open to multiple service providers. 10(6) requires them to do interoperate. (Standards such as ASTM F3548-21 enable this) The AMC/GM cannot oppose the regulation for which it is written. The comment requires a revision of the regulation itself.
change to text	Yes
comment	GM1 Article 10 UAS flight authorisation service It has to be clear that the “final flight authorisation” mentioned in this GM1 does not include any other necessary authorisations/clearances of an ANSP etc. Please clarify that the responsibility for issuing a clearance in controlled airspace remains with ATC.
response	NOT ACCEPTED. The U-space is segregated from the controlled airspace, and the operations are not placed under the controlled of the ATC. As per the 2021/664 the USSP are entitled to provide flight authorisation.
change to text	No
comment	GM1 Article 10 UAS flight authorisation service It should remain in the responsibility of each MS to decide in compliance with their national law if the flight authorisation service is connected with the exercise of the power of a public authority. The regulation leaves it open whether the activity has to be performed in a public authority capacity or not.
response	NOT ACCEPTED. The regulation requires that U-space service provision is open to multiple service providers. 10(6) requires them to do interoperate. (Standards such as ASTM F3548-21 enable this.) The AMC/GM cannot oppose the regulation for which it is written. The comment requires a revision of the regulation itself.
change to text	No
comment	GM1 Article 10 UAS flight authorisation service "on the same route" should be replaced with "in the same area".
response	ACCEPTED
change to text	Yes, as suggested



comment	GM1 Article 10 UAS flight authorisation service State changes should reference definitions in applicable standards, including ASTM F3548-21.
response	NOTED. At this stage the wording is meant to remain generic. At a subsequent stage improve convergence with the standard might be foreseen.
change to text	No

comment	GM1 Article 10 UAS flight authorisation service The flight requests should not only be checked against conflicts with other unmanned operations within the same U-space airspace, but against manned operations, too.
response	ACCEPTED. This issue is addressed in the AMC/GM for article 10(5)
change to text	Yes

comment	GM1 Article 10 UAS flight authorisation service The flight authorisation should be coordinated by the CISP. Again, it seems implied that the activation of the TIS service begins after the activation of the flight. The TIS could also be used prior the activation
response	PARTIALLY ACCEPTED 1 The original text about coordination with ATC was an unexplained reference to the possibility that a flight would pass from U-space airspace into a region under control of ATC. For example a flight from an urban area to an airport. This proposal is now considered beyond the scope of the regulation and the reference to coordination with ATC has been removed from the AMC/GM 2 The AMC/GM for article 10(5) explains the activation process in more detail.
change to text	Yes

comment	GM1 Article 10 UAS flight authorisation service GM1 Article 10(f) should read: "When there is more than one USSP providing U-space services in a U-space airspace, and/or a single CISP, all USSPs are obliged to exchange the UAS flight authorisation requests between themselves and the single CISP as well as state changes of those requests – Activated, Withdrawn, Ended."
response	Not Accepted.



change to text	<p>The regulation does not mention that the CIS is involved in the process of flight request authorisation. Article 10(6) requires that the “U-space service providers shall establish proper arrangements...” The AMC/GM cannot revise the regulation.</p> <p>No</p>
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>A different wording for paragraph (b) to GM1 Article 10 could be needed. Article 10.1 of Regulation 2021/664 makes mandatory that a flight authorization should be provided to each single UAS flight, not being an exception the existence of a repetitive numbers of flights that are conducted on the same route. If this fact (the need for an authorization in every case, including the existence of a repetitive number of flights that are conducted on the same route) wants to be described as guidance material, more precise terms could be needed.</p> <p>However, if the intention is to remark that the USSP must have the capability of handling the authorizations in such cases, a different wording might be needed, making reference to a different Article (for example, developing Article 10.7).</p>
response	<p>NOT ACCEPTED. By definition each single flight needs to be covered by a flight authorisation.</p>
change to text	<p>No</p>
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>In Paragraph (c) some references have been added, including a reference to a needed agreement between the USSP and the competent authority about additional functions which are to be included to better serve UAS operations, at the same time they have to be approved.</p> <p>It is considered that only the competent authority may approve them. Consequently, to avoid any misunderstanding any reference to ‘agree’ would need to be changed in this case by terms like request, propose, etc.</p>
response	<p>PARTIALLY ACCEPTED. The text has been clarified.</p>
change to text	<p>Yes</p>
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>This paragraph explains that this service [flight authorization service] covers the flight authorisation provided according to Article 15(1) of Regulation 2019/947. U-Space airspace is different from UAS geographical zones. To impose a restriction in a particular airspace, which is the essence of the geographical zone, the Member State and the Competent Authority will have to fulfil some requirements.</p>



	<p>And to declare or designate a volume of airspace as a U-Space airspace, other requirements will have to be fulfilled by the Member State and the Competent Authority.</p> <p>It is considered that the fulfilment of the requirements of Regulation (UE) 2021/664 doesn't imply to fulfil the requirements of Regulation (UE) 2019/947. Consequently, it wouldn't be correct to say that UAS flight information service covers the flight authorisations provided according to Article 15(1), which is independent of this service and it is responsibility of the UAS operator and not of the USSP.</p> <p>The only scope of this service would be to check that the UAS fulfil the restriction and, in its case, to reject the clearance. But the responsibility would be always placed on the UAS operator.</p>
response	PARTIALLY ACCEPTED. The U-space may encompass UAS geo-zones as per the 2019/947. The text has been clarified.
change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>(f) We recommend to change this GM to AMC as it is mandatory for the USSPs, and additionally it would be advisable to include "in real time" when talking about "exchange the UAS flight authorisation".</p>
response	ACCEPTED. An AMC is completed to enforce those aspects.
change to text	Yes
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>Which data from the UAS flight authorisation requests should be allowed to be passed on? Is the 4D volume and the unique authorisation number sufficient? When sharing data, it should be considered that a USSP competitor may have a strong interest in poaching customers from the competition.</p>
response	NOTED. This point is also covered in the AMC/GM of article 10(6) on the "proper arrangements" between USSP.
change to text	No
comment	<p>GM1 Article 10 UAS flight authorisation service</p> <p>Point (c) Does "overlap" here mean "interference"? If yes, adapt the text accordingly, if not please clarify the meaning. The doubt is reinforced when reading GM1 Annex IV UAS flight authorisation request referred to in Article 6(4) that indicates: "(b) The 4D trajectory</p>



	describes a series of one or more 4D volumes each with entry and exit times. The operator submits this series of volumes committing to remaining within them. The volumes may overlap to express uncertainty in any dimension; for example, time. The conflict detection process is simply the identification of overlapping 4D volumes."
	Replace "overlap" by "interference" if that is the intended meaning.
response	NOTED. The U-space may encompass UAS geo-zones as per the 2019/947. The text has been clarified.
change to text	No

comment	GM1 Article 10 UAS flight authorisation service Point (d) The meaning of this GM is not understood. The only mention of ANSP in article 10 is in point (10) and is about "continuous check [of] existing flight authorisations against new dynamic airspace restrictions and limitations, and information about manned aircraft traffic shared .../..." which does not correspond to a "coordination" that is normally a two-way process. Is that intended for any airspace or only for controlled airspace?
response	PARTIALLY ACCEPTED. The original text about coordination with ATC was an unexplained reference to the possibility that a flight would pass from U-space airspace into a region under control of ATC. For example a flight from an urban area to an airport. This proposal is now considered beyond the scope of the regulation and the reference to coordination with ATC has been removed from the AMC/GM
change to text	Yes

comment	GM1 Article 10 UAS flight authorisation service "(d) The USSP is expected to coordinate the flight authorisation with the ANSP and is responsible for providing the final flight authorisation to the UAS operator." The issuing of clearances in controlled airspaces is a sovereign task. SERA.8005 says, ATC is responsible in controlled airspaces. Accordingly, only ATC can issue clearances. There are doubts that a coordination is sufficient. The USSP needs the consent/approval of ATC
response	NOT ACCEPTED. The U-space is segregated from the controlled airspace, and the operations are not placed under the controlled of the ATC. As per the 2021/664 the USSP are entitled to provide flight authorisation
change to text	No

comment **GM1 Article 10(2) UAS flight authorisation service**



	<p>(a) Based on the rest of the text, trajectory conflicts are not intersections, but intersections (or overlaps) of "4D" buffer volumes.</p> <p>(b) Please define what a 4D trajectory is. Is this a list of waypoints with associated target times? This is in conflict with further down the text where flight authorisations are based on 3D volumes with entry- and exit times. Please define height.</p> <p>The notion of "4D" shapes or volumes is misleading. Usually what is meant is a 3D shape that has some very specific, time-related attributes associated with it. I suggest to define precisely what is meant by the term.</p>
response	ACCEPTED. The text has been revised to clarify the points raised in the comment.
change to text	Yes
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>The writing of this point is confusing. The sequence of events is not clear, and many interpretations can be given. It would be necessary to clarify details such as what is meant by "or entering the airspace". It would be necessary to clarify the exception of "unless an active flight is being updated" What type of updates it refers to? An example could be useful.</p>
response	ACCEPTED. The text has been revised to clarify the points raised in the comment.
change to text	Yes
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>Time can be a differentiating element between USSPs to provide a better service to users. Is a minimum time going to be defined for security reasons?</p>
response	ACCEPTED. The AMC/GM has been revised to clarify the points raised in the comment. Time constraints have been added.
change to text	Yes
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>(b) Authorisation for the flight is to given for the exact time defined in the 4D trajectory? What leniency/bandwidth is the USSP to keep here? (c) What are the required separation minima, if any?</p>
response	PARTIALLY ACCEPTED. The AMC/GM has been revised to clarify the points raised in the comment, especially the AMC/GM to 10(5) on activation or deviation thresholds.



change to text	Yes
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>AMC/GM should elaborate the concept of permissible conflicts. Depending on the type of airspace constraints, some conflicts may be permissible for some types of UAS operations, and non-permissible for some others. Refer to ASTM F38 Standard for UTM/USS Interface.</p>
response	NOT ACCEPTED. The comment is on the regulation. In ASTM F3548-21 it is proposed that the resolution of some conflicts detected at the strategic phase may be deferred until the tactical phase. This may be safe in some situations, but it is not in line with the regulation and the AMC/GM cannot contradict or revise the regulation.
change to text	No
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>Regarding point (d) Activation is only possible for authorisation requests that have been approved.</p> <p>Best practice could be captured, i.e. to expand the text by the requirement that the activation can only be done if the pilot is in accordance with the departure time slot and departure location as indicated in the authorization (to be physically in time and place), otherwise a updating message must be sent before the activation can be confirmed. Such procedure reduces the possibility of a false/erroneous activation request being submitted from the office.</p>
response	
response	ACCEPTED. The AMC/GM to Art 10(5) have been revised to clarify the points raised in the comment.
change to text	Yes
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>Comments:</p> <p>Article 10(2)(b) states that flight authorisation requests must be “free of intersection in space and time with any other notified UAS flight authorisations within the same U-space airspace”. We recommend that an AMC be added that recommends that other notified UAS flight authorizations across different USSPs within the same U-Space airspace be identified through the use of a Discovery and Synchronization Service (DSS), as described by the ASTM standard WK63418.</p> <p>Rationale / Justification:</p> <p>Harmonization across Member States requires member states to use a common standard, and ASTM WK63418 is mature and has been developed with significant input from</p>



	industry. Harmonization in how other notified flight authorizations are identified is important to enable cross-border operations. Hence compliance with the standard should be recommended.
response	PARTIALLY ACCEPTED. That recommendation is made in the GM for 10(6). At this stage, the use of a DSS is one of the possibilities.
change to text	Yes
comment	GM1 Article 10(2) UAS flight authorisation service A uniform height reference model should be established. WGS-84 is best suited for this purpose. Only with a uniform height reference model is it possible for flights to be conducted at different altitudes.
response	NOTED. The recommendation is hint in the AMC/GM to Art(8).
change to text	No
comment	GM1 Article 10(2) UAS flight authorisation service Item (d) contradicts GM1 Art. 6 where it is stated under point (c) that UAS operators “are not allowed to commence their flight until they have sent an activation request of the UAS flight authorisation to the USSP.” And why is this part of the GM for Art.10(2) when Art.10(5) is dealing with the activation of the flights?
response	PARTIALLY ACCEPTED. The AMC/GM related to Activation is now consolidated in the GM for 10(5).
change to text	Yes
comment	GM1 Article 10(2) UAS flight authorisation service If the minimum time between the UAS flight authorisation and the activation is determined, it should also be determined in which time window the UAS operators can expect a response to their requests. From the UAS operator's point of view, a corresponding specification would be preferable.
response	PARTIALLY ACCEPTED. The response to the activation request, should be performed without undue delay. The AMC/GM related to Activation is now consolidated in the GM for 10(5).
change to text	Yes
comment	GM1 Article 10(2) UAS flight authorisation service



	<p>It is suggested to amend the Reg.664 Art.10 2b) so as to combine it with Art.10 5 (-> to add "free of intersection with airspace limitations"). A similar logic is applied to manned a/c FPL which will get rejected if the planned route intersects with active restricted or segregated areas, unless the FPL contains the "Route coordinated with ATC" phrase, and possibly a Non-Standard Flight Approval number.</p> <p>A flight is commenced by taking off and probably that is the point when it should be activated, not during en-route before entering the U-space boundary. The EET (border-crossing) time could be calculated for the moment when the UAS is planned to enter the U-space.</p>
response	PARTIALLY ACCEPTED. The GM of 10(2) and 10(5) have both been considerably revised. For instance, the overlap with the airspace limitation has been added.
change to text	Yes
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>We believe that the probability for a drone flight to be outside the planned volume shall be less than 5%.</p>
response	PARTIALLY ACCEPTED. The GM for 10(2)(d) has been revised.
change to text	Yes
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>"trajectory typically in terms of height, length, width, and duration and ensures that the trajectory does not conflict with a no-fly zone" should be replaced with "volume, which is in line with ASTM F3548-21 "Standard Specification for UAS Service Supplier (USS) Interoperability" a volume of airspace defined in terms of latitude, longitude, and altitude (such as a circle or polygon with vertical extents) plus a start and end time for the volume"</p>
response	NOT ACCEPTED. At this stage the definition is deemed be equivalent. Further reliance on the standard may lead to revision.
change to text	No
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>It is suggested to clarify that the 4D trajectory may be defined in terms of a sequence of waypoints plus time, whereas the 'UAS corridor' or 4D volume around that trajectory is defined by its height, length, width along each flight segment, and duration. Those 'UAS corridors' should not intersect nor conflict with a no-fly zone for the UAS flight to be authorised.</p>



	The trajectory must be defined in 3D space, often based on a 2D flight path at constant height above ground level. The capability to reach waypoints within specific time windows (known as Time Of Arrival Control – TOAC in ICAO Doc 9613 and Time error from target in ASTM F.38 WK75923) should be considered as an optional feature.
response	NOT ACCEPTED. The text has been revised, but the 4D trajectory remains the safest and preferred approach.
change to text	No

comment	GM1 Article 10(2) UAS flight authorisation service a) a definition of a "no-fly" zone would need to be added, or a reference on where to find a definition
response	PARTIALLY ACCEPTED. The notion is well established in the Art 15 of 2019/947. The AMC/GM are slightly clarified.
change to text	Yes

comment	GM1 Article 10(2) UAS flight authorisation service d) One might conclude that taking off (without USSP feedback) means the same as activating the flight. From our understanding, the operator requests activation and should take off just after the USSP has confirmed. The wording would therefore be changed.
response	NOT ACCEPTED. For safety purpose, the Operators must not take off without activation. The GM for 10(5) has been expanded to better explain the activation process.
change to text	No

comment	GM1 Article 10(2) UAS flight authorisation service Where are / How will be defined the separation requirements? Could they be U-Space specific?
response	ACCEPTED. Those aspects have been clarified, in the AMC/GM to Art 3(4) and to Art 10.
change to text	Yes

comment	GM1 Article 10(2) UAS flight authorisation service The cause for rejection can and shall not always be known. E.g. rejections due to police operations, military operations, national security, etc...
response	NOT ACCEPTED. Those conditions are foreseen in Art 10(8).



change to text	No
comment	<p>GM1 Article 10(2) UAS flight authorisation service</p> <p>Suggestion: The 4D trajectory should be defined as the 95% volume of the drone operation, not as a line.</p>
response	PARTIALLY ACCEPTED. Both are possible, the GM for 10(2) and 10(2)(d) have been revised due to this and other comments.
change to text	Yes
comment	<p>AMC1 Article 10(1) UAS flight authorisation service</p> <p>Coordination and collaboration between different USSPs (with potentially different business cases and functions) is essential. How will fair, transparent coordination between and proper collaboration of different USSPs -with potentially different business cases – function?</p>
response	NOTED. The general need for cooperation is expressed "establish proper arrangements." The AMC-GM aims to enable the competent authority to detect problems in this regard - see AMC to 10(1) on Recording. It is expected that as experience of U-space grows, best practice will emerge. The ASTM standard F3548-21 offers a solution to some aspects of this requirement.
change to text	No
comment	<p>AMC1 Article 10(1) UAS flight authorisation service</p> <p><u>Comments:</u> Proposal to add an additional recording requirement: "USSPs should record ALL digital interactions with approved operators - request types and times."</p> <p><u>Rationale / Justification:</u> It will be critical to have a system level view of all operator interactions with the Flight Authorization service in order to assess the fairness of U-space between various operators. For example requests to change authorizations, requests to remove authorizations, failed requests across operators in a shared airspace would provide a quantitative view into the fairness of the U-space.</p>
response	PARTIALLY ACCEPTED. The need to assess fairness, based on data, has been enforce in new GMs. The AMC on recording has been combined with the GM on logging.
change to text	Yes
comment	AMC1 Article 10(1) UAS flight authorisation service



	Mention for how long the records should be kept (it is mentioned in article 15 (g) (30 days) and 15(e) AMC16 (5 years))
response	ACCEPTED. The need to observe trends in the traffic demand reasonably suggests a 5 years period. A new GM is added.
change to text	Yes
comment	AMC1 Article 10(1) UAS flight authorisation service Should read: "USSPs (and the single CISP where applicable) should record..."
response	NOT ACCEPTED. Article 10 does not involve the CISP.
change to text	No
comment	AMC1 Article 10(1) UAS flight authorisation service This AMC requires 'recording' of all flight authorization. both accepted and rejected. This seems to be in conflict with GM2 to article 10(1) about logging. EASA to clarify the difference between the "Recording" and "Logging".
response	ACCEPTED. As a result of this and similar comments, the GM on logging and AMC on recording have been combined.
change to text	Yes
comment	AMC1 Article 10(1) UAS flight authorisation service The EASA editorial team has added an AMC that duplicates a GM. UAS flight authorisation service is duplicated in GM2 Article 10(1) UAS flight authorisation service.
response	ACCEPTED. As a result of this and similar comments, the GM on logging and AMC on recording have been combined.
change to text	Yes
comment	GM1 Article 10(1) UAS flight authorisation service The writing of this point is confusing. The sequence of events is not clear, and many interpretations can be given. It would be necessary to clarify details such as what is meant by "or entering the airspace". It would be necessary to clarify the exception of "unless an active flight is being updated" What type of updates it refers to? An example could be useful.



response	NOTED. Due to this and similar comments, the GM relating to activation has been consolidated in section 10(5).
change to text	Yes

comment	<p>GM1 Article 10(2)(d) UAS flight authorisation service</p> <p>The section seems to use these three formulations interchangeably:</p> <ol style="list-style-type: none"> 1. a volume containing a flight with a probability of 95% 2. staying within a volume at 95% of the time 3. going outside the planned volume with a probability of less than 5% <p>These three things are not the same (though 1. and 3. are very similar). Note that models 1 and 3 do not encourage a return to the plan once an excursion has occurred. As a KPI, the excursion has already happened and counts fully, independent of the further actions of the operator.</p> <p>Furthermore, (c) implies that the thresholds (which are not defined) are determined by the USSP. Previously it was implied though that this is a parameter the operator choses since she knows the performance limitations of the vehicle best.</p>
response	ACCEPTED. The GM to 10(2)(d) has been revised. More consistent terminology has been one goal of this revision.
change to text	Yes

comment	<p>GM1 Article 10(2)(d) UAS flight authorisation service</p> <p>This GM introduces new terminology, namely:</p> <ul style="list-style-type: none"> - Performance-based buffers - Nominal path - Operational intent - Planned 4D volume <p>These new terms differ from the semantics in SORA (i.e. flight geography, operational volume, contingency volume, etc.) and adopted as AMC for the IR 2019/947. It is recommended:</p> <ol style="list-style-type: none"> a) Whenever a new concept is introduced, define it clearly, and, b) Try to use terminology consistently not only across the NPA but also across other pieces of regulation. <p>Additionally, a definition for 'exceptional event' should be provided and whether it differs (or not) from a contingency situation.</p> <p>Finally, please cross-check the reference to the Section 5.1.2 of ICAO Doc 9997. The section 5.1.2 of Appendix A refers to accuracy (not integrity, which is section 5.2.1 of the same appendix).</p>
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response	ACCEPTED. The GM has been deeply redrafted.
change to text	Yes

comment	GM1 Article 10(2)(d) UAS flight authorisation service It is stated in subsection (a) in the GM that Integrity is referred to in Section 5.1.2 from ICAO Doc 9997, but the related section is about accuracy, with the risk of the GM to be misleading. Please clarify.
response	ACCEPTED. The GM has been significantly redrafted and now refers to the collision risk model.
change to text	Yes

comment	GM1 Article 10(2)(d) UAS flight authorisation service There should be practical, empirical, and manageable methods to calculate the Deviation Threshold
response	PARTIALLY ACCEPTED. The section on Deviation Threshold has been subject to considerable comments and change. The approach and content has been clarified.
change to text	Yes

comment	GM1 Article 10(2)(d) UAS flight authorisation service This point conflicts with operational airspace volumes defined in 947 by SORA (NPA 2021-09)
response	NOT ACCEPTED. U-space complements and supersedes the 947 on some instances.
change to text	No

comment	GM1 Article 10(2)(d) UAS flight authorisation service It says “planned volume”: who is responsible for determining the size of the 4D volume (as opposed to the trajectory)? Is it up to the operator, or does the USSP set a certain safety buffer for each intended UAS flight? Are there going to be determined guidelines per weight class for instance?
response	NOTED. The UAS operator is responsible is to plan and request the flight authorisation (volume, route, time,...).
change to text	No



comment	<p>GM1 Article 10(2)(d) UAS flight authorisation service</p> <p>PBN-comparable containment criteria may only be valid for deviation thresholds aimed at preventing a UAV-UAV collision. Where such criteria would be used for the detection and prevention of conflict with the operational constraints, whereby the operational constraint represents a volume of controlled airspace, the application of PBN-comparable criteria may result in an increased risk for IFR aircraft operating in the controlled airspace. This is especially valid where the ASTM F38 ‘Standard Specification for UAS Service Supplier (USS) Interoperability’ is taken for the detection of conflicts between an operational intent volume and an operational constraint.</p> <p>EASA is invited to develop GM to clarify this type of hazard in using the PBN containment criteria for operations in close proximity to controlled airspace. Additionally, EASA is invited to develop AMC to instruct MS to include consideration of this hazard in the determinations of buffers for the U-space airspace.</p>
response	<p>NOT ACCEPTED. In controlled airspace the separation with manned aircraft is ensured by the ATC and the dynamic airspace reconfiguration.</p>
change to text	<p>No</p>
comment	<p>GM1 Article 10(2)(d) UAS flight authorisation service</p> <p>In order to perform the activity defined in IR 664 Art. 10.2.(b): "accept the UAS flight authorisation request if the flight under the UAS flight authorisation is free of intersection in space and time with any other notified UAS flight authorisations within the same U-space airspace in accordance with the priority rules set out in paragraph 8;" it is demanded to clarify if the USSP has to take into account only the 4D trajectory, or the 4D trajectory plus the Deviation Threshold (4D Volume).</p>
response	<p>ACCEPTED. The USSP has to consider the 4D trajectory plus the Deviation Threshold, to determine the 4D Volume to be checked..</p>
change to text	<p>Yes</p>
comment	<p>GM1 Article 10(2)(d) UAS flight authorisation service</p> <p>It is requested an explicit definition of "UAS Flight Authorization Request" and "UAS Flight Authorization".</p> <p>It should be explicitly defined that the "UAS Flight Authorization Request", in line with IR 664 Annex IV, only contains the 4D Trajectory; while for the "UAS Flight Authorization" it is considered the 4D Volume conformed by the 4D Trajectory plus the Deviation Threshold added by the USSP.</p>



	This explicit definition should include graphical diagrams (as in the NPA2021-09 when defining Flight Geography, Operational Volume, etc).
response	PARTIALLY ACCEPTED. This comment has influenced the changed to numerous GM to bring the suggested clarifications, especially on terms and conditions in GM1 to 10(1). A diagram may be further considered.
change to text	Yes

comment	GM1 Article 10(2)(d) UAS flight authorisation service Are the deviation thresholds not device-specific? And what is the link to the buffers that have to be specified in the specific category in the application for an operational authorisation under EU regulation 2019/947?
response	NOT ACCEPTED. The 2021/664 goes beyond the 2019/947 with regard to Air Risk, per the 2021/664 performances, constraints,... are to be defined to ensure safety of the operations. The deviation thresholds are one of those criteria.
change to text	No

comment	GM1 Article 10(2)(d) UAS flight authorisation service There is a common misconception that drones are constantly deviating from their flight path, such as due to gusts of wind. Especially with automatically controlled drones, the route accuracy is very precise, and gusts of wind are immediately compensated for by the flight management system.
response	NOTED. As a matter of fact, all aircraft may have their trajectory influenced by the weather conditions, unmanned aircraft included. The effects depend to the severity of the weather conditions and the performances of the UAS.
change to text	No

comment	GM1 Article 10(2)(d) UAS flight authorisation service What is considered low traffic density from the authors' point of view? When reading the NPA, the reader gets the impression that the authors have so far assumed that single flights per day are to be expected in the next few years. Apparently, the needs of the market have not been sufficiently investigated. For if they had done so, they would have found that there is already a demand for several hundred flights a day in a major city.
response	NOTED. The current approach of the regulation and the AMC-GM minimises the use of tactical services. It is recognised that another approach that makes more use of tactical separation processes will permit higher densities of traffic. The current traffic is considered



change to text	low density in comparison with that. What the numbers are in practice will be determined by experience. The AMC-GM does not mean to give the impression that the capacity will prevent the achievement of hundreds of flights per day in a city.
	No
comment	GM1 Article 10(2)(d) UAS flight authorisation service It should be clarified which method will be recognized to calculate the wind & other sources of deviations. "GM1 Article 10(3) UAS flight authorisation service" indicates that it is the sole responsibility of the UAS operator, however the overall safety of the operations is based on that.
response	ACCEPTED. The text on deviation thresholds has been revised, new AMC has been integrated to the Art 6.
change to text	Yes
comment	GM1 Article 10(2)(d) UAS flight authorisation service This GM should clarify the link between "volume containing the flight" and the volumes defined in "AMC1 Article 11 Rules for conducting an operational risk assessment" of (EU)2019/947. Consistency is mandatory to avoid misunderstandings
response	ACCEPTED. The text on deviation thresholds has been revised following this and similar comments.
change to text	Yes
comment	GM1 Article 10(2)(d) UAS flight authorisation service Time can be a differentiating element between USSPs to provide a better service to users. Is a minimum time going to be defined for security reasons? For example: Emergency drone needs.
response	PARTIALLY ACCEPTED. The text has been greatly changed as a result of this and other comments.
change to text	Yes
comment	GM1 Article 10(2)(d) UAS flight authorisation service This GM states that, for a drone flight, going outside the planned volume is to be exceptional event with a probability of less than 5%. We believe that the probability for a drone flight to be outside the planned volume shall be less than 5%.



response	NOTED. The 95% is suggested from a calculation based on the Reich collision risk model. The competent authority may revise this figure.
change to text	No
comment	GM1 Article 10(2)(d) UAS flight authorisation service When the deviation threshold is set by the CA of the MS, it will not be harmonised.
response	NOT ACCEPTED. The U-space approach is performance based, therefore indeed the required constraints and performance requirements may vary between U-spaces.
change to text	No
comment	GM1 Article 10(2)(d) UAS flight authorisation service It is not clear if the operator bears any regulatory obligation in meeting 95% or following the nominal path as they are following ICAO Doc 9997 or if the requirement is solely managed by the USSP [and accompanying SLA].
response	PARTIALLY ACCEPTED. The GM text has been revised. The obligation is on the UAS operator to plan a volume large enough to contain the flight with 95% probability. It seems likely that in case of uncertainty we can expect this to be interpreted as "at least 95% probability." However overly large volumes will increase the chance of conflicts.
change to text	Yes
comment	GM1 Article 10(2)(d) UAS flight authorisation service After "5%", add " of the flight time as validated by the USSP over time, in line with ASTM F3548-21 "Standard Specification for UAS Service Supplier (USS) Interoperability". This implies that the operational intent definition takes into account UAS operational performance, specifically including Total System Error (TSE) which encompasses operator proficiency and weather conditions"
response	PARTIALLY ACCEPTED. AMC on Art 13, is slightly revised.
change to text	Yes
comment	GM1 Article 10(2)(d) UAS flight authorisation service



	(e) In our understanding, the 95% represent the minimum value and might be adjusted more restrictively, resulting in a higher value. If this is intended it should be phrased unambiguously.
	Proposed change: (e) "(...) The 95 % may need to be increased if there is a increase in the traffic density."
response	PARTIALLY ACCEPTED. The point is valid, this aspect has been brought back to the outcome of the Airspace risk assessment, and could be adjusted by the competent authority.
change to text	Yes

comment	GM1 Article 10(2)(d) UAS flight authorisation service We recommend to link the deviation threshold to the U-Space Risk assessment, where it should be set this figure as an output of the risk assessment, and remain as a fixed parameter for the USSPs requirements.
response	ACCEPTED. The GM has been transferred to the set of new AMC/GM to the Art 3(4).
change to text	Yes

comment	GM1 Article 10(2)(d) UAS flight authorisation service It is strongly recommended to clarify in more detail the several definitions of volumes with respect to the planning of a flight/operation. Futher it should be clarified which volumes are exchanged amongst USSP's for strategic deconfliction. This is also closely linked to the triggering of conformance monitoring. We understand the process as the following: A operator within the Flight Authorization process defines a 4D volume (what are the criteria/margins); on top of this, depending on the U-space area, a deviation threshold is added to this 4D volume drawn by the operator. Question is thus is if ower interpretation is right, see below: 4D volume (drawn by operator) + deviation threshold (defined by U-space assessment) = 95%?
response	NOTED. The interpretation is correct.
change to text	No

comment **GM1 Article 10(2)(d) UAS flight authorisation service**



<p>response</p> <p>change to text</p>	<p>We doubt that the collision risk can be assumed to be low even in the first few years of operation within U-space. Being only one of several HEMS operators in Germany, our own operation alone conducts more than 52.000 HEMS missions per year, each of them consisting of several flight legs and most of them near of under the 500 ft AGL threshold. Already now we are reporting airprox events with UAS in increasing numbers.</p> <p>NOTED. The issue can only be addressed if HEMS are made visible to USSPs. In that case U-space will be an asset to prevent risk of mid-air collision with HEMS.</p> <p>No</p>
<p>comment</p> <p>response</p> <p>change to text</p>	<p>GM1 Article 10(2)(d) UAS flight authorisation service</p> <p>On (a), the ICAO Doc 9997 Appendix A, Section 5.1.2 deals with accuracy, not integrity. Moreover, Performance Based Navigation (PBN) and Required Navigation Performance (RNP) concepts, should take as a baseline the ICAO Doc 9613 ‘PBN Manual’ as well as other standards such as EUROCAE ED-75D ‘MASPS RNP for Area Navigation’. A set of RNP navigation specifications should be derived tailored to the specific characteristics and operational envelope of UAS. The requirement for a <u>containment of 95% of the Total System Error (TSE)</u>, known as the accuracy value or RNP value, deals with the <u>accuracy, not integrity</u>. Under normal circumstances the UAS might fly outside of the 4D 95% volume for up to 5% of the flight time.</p> <p>On (c), the <u>deviation threshold</u> related to the <u>integrity</u> mechanism is not the accuracy value (95%), but <u>two times the accuracy value</u>. The probability that the TSE exceeds such deviation threshold without annunciation should be less than the integrity risk (10^{-5} per flight hour in manned aviation and TBD for UAS).</p> <p>On (d), the flight trajectory of an UAS should be carefully designed to ensure flyability, considering the type of UAS (fixed wing/multi-copter), its dynamics (speed,...) as well as the environmental factors (wind, gust...). Guidance material on the design of UAS flight trajectories should be developed for UAS operators. Going outside of the 4D 95% volume is not exceptional since the probability can be as large as 5% of the flight time.</p> <p>On (e), the 95% containment value, i.e., the accuracy value or RNP value, must never be used for the assessment of collision risks. Note that the deviation threshold for integrity is established at two times the accuracy value. Specific criteria exist on the minimum separation between parallel tracks.</p> <p>PARTIALLY ACCEPTED. The text has been greatly revised following this and other comments.</p> <p>Yes</p>
<p>comment</p>	<p>AMC1 Article 10(3) UAS flight authorisation service</p>



response	<p>What is the source of these QNH data? Is the USSP required to gather these data themselves, i.e. locally in the u-space airspace? Or could this be a regional QNH coming from the ANSP via the CIS?</p>
change to text	<p>ACCEPTED. The text has been greatly revised following this and other comments. The new approach is to request a check of the weather conditions (obtained through the weather information service) and the limitations that may be expressed by the MS.</p>
comment	<p>AMC1 Article 10(3) UAS flight authorisation service</p> <p>It is assumed that the QNH would be necessary whenever a UAS operator would be required to express their vertical position with reference to mean sea level. However, QNH may also be needed by the operator in order to avoid terrain and obstacles, however, on this the USSP may have no knowledge. Therefore, the need for the QNH would either exist:</p> <ul style="list-style-type: none"> - due to requirements for level reporting, as imposed by the USSP or an applicable operational constraint, in which case, the USSP would be able to detect the need and deliver QNH without the operator's asking; Or – due to requirements for terrain and obstacle avoidance, in which case, the USSP may deliver the QNH only when so required by the operator. <p>AMC should clarify the meaning of “required by the operational conditions”.</p> <p>Knowing that MET providers normally provide “local” QNH for operations in the vicinity of an aerodrome, and a “regional” QNH, for operations further away from an aerodrome, it is recommended that the AMC differentiates between the two, based on the type of operation and the operational need.</p>
response	<p>ACCEPTED. The text has been greatly revised following this and other comments. The new approach is to request a check of the weather conditions (obtained through the weather information service) and the limitations that may be expressed by the MS.</p>
change to text	<p>Yes</p>
comment	<p>AMC1 Article 10(3) UAS flight authorisation service</p> <p>It is not fully understood why this requirement on QNH is in the 'UAS flight authorisation service' section instead of the 'Weather Information Services' section. If this information is to be included, the relationship between unmanned operations and manned operations and the various height datums that might be used depending on the nature of the operation; above ground level (immediately below the aircraft), GNSS on world Geoid - WGS 84, barometric (QNH, QFE, or even Standard Pressure Setting of 1013.25 hPa for high altitude flights) seems to be a challenge that still needs to be resolved (SESAR ICARUS project may have some insight).</p>



response	ACCEPTED. The text has been greatly revised following this and other comments. The new approach is to request a check of the weather conditions (obtained through the weather information service) and the limitations that may be expressed by the MS.
change to text	Yes
comment	<p>AMC1 Article 10(3) UAS flight authorisation service</p> <p>Weather service is not mandatory but the USSP is supposed to provide QNH when needed. Where is the USSP supposed to derive QNH values for any geographical location and which standard is required? Official values are usually only provided at airports.</p>
response	ACCEPTED. The text has been greatly revised following this and other comments. The new approach is to request a check of the weather conditions (obtained through the weather information service) and the limitations that may be expressed by the MS.
change to text	Yes
comment	<p>AMC1 Article 10(3) UAS flight authorisation service</p> <p>"Whenever QNH is <u>required</u> by the operational conditions, then the appropriate QNH with the geographical location of its applicability <u>should</u> be provided by the USSP as part of the authorisation". Is should enough when it is considered required? And shouldn't QNH be part of the non-mandatory weather service described in article 12, not here in article 10?</p>
response	ACCEPTED. The text has been greatly revised following this and other comments. The new approach is to request a check of the weather conditions (obtained through the weather information service) and the limitations that may be expressed by the MS.
change to text	Yes
comment	<p>AMC1 Article 10(2)(c) UAS flight authorisation service</p> <p>All aspects of fairness as mentioned above have to apply. In order to avoid illegitimate, unjustified rejections by USSPs, transparent feedback is needed from the UAS operators, UTM service providers and UAM communities to validate the fairness considerations highlighted already in this document. This approach should then be tested by applying it to quantify the fairness implications of existing proposed approaches to resource allocation in UTM, to develop prioritization schemes and resource allocation algorithms that improve fairness, and to evaluate the impact of using these schemes and algorithms in different UTM architectures, at scale. There is also a need to explore the trade space of methods by which this resource allocation can be performed and explore how these will work in a federated or centralized architecture. Simulation work could be followed by interoperability demonstrations that focus on the allocation of resources, and on negotiation.</p>



response	ACCEPTED. The competent authority should be able to investigate claims of improper action or treatment thanks to the provisions of recording mentioned in AMC1 Article 10(1) UAS flight authorisation service. AMC/GM to Art 3(4) and Art 10 are added to address those concerns.
change to text	Yes
comment	AMC1 Article 10(2)(c) UAS flight authorisation service If the minimum time between the UAS flight authorisation and the activation is determined, it should also be determined in which time window the UAS operators can expect a response to their requests. From the UAS operator's point of view, a corresponding specification would be preferable.
response	PARTIALLY ACCEPTED. Regulation 2021/664 article 10(5) mentions this response should be given "without unjustified delay." GM1 to article 10(5) proposes an interpretation of this into an expected performance of a response with 5 seconds 95% of the time. Point d of AMC1 to article 10(5) requires the responses (including how long each takes) to be non-discriminatory.
change to text	Yes
comment	AMC1 Article 10(3) UAS flight authorisation service The GM should cover both drone operation start & end inside or outside U-space. Also provide more info about what the difference is of being inside or outside the defined U-space.
response	PARTIALLY ACCEPTED. The regulation only covers the regime inside U-space airspace, and this AMC/GM is for the regulation hence this AMC/GM cannot comment on other airspace. However it may be that a flight flies into or flies out of U-space airspace. The GM has been revised to attempt to cover such cases succinctly.
change to text	Yes
comment	AMC1 Article 10(5) UAS flight authorisation service Item (d) Please give guidance on how this can be shown without disclosing potentially sensitive material. E.g. it is easy to show by providing all the API request logs, but this may disclose trade secrets.
response	PARTIALLY ACCEPTED. The paragraph has been removed. The USSP only needs to demonstrate their performance to the competent authority.
change to text	Yes



comment **AMC1 Article 10(5) UAS flight authorisation service**

The authorisation process is as follows:
 Operator sends UAS flight authorisation request
 USSP: receives request and after checking, sends UAS flight authorisation
 Operator: sends activation message (roughly similar to ready for departure?)
 USSP: final recheck of flight authorisation and sends Activation

How, exactly, is activation done? In GM1 Article 10(2) (d) it says that the UAS activates by taking off or entering the airspace, but here it says confirmation is sent by the USSP after a final check. Therefore, the UAS should not already be flying, correct? Or does the USSP need a flying UAS to check whether the UAS network identification and flight data are 'alive' and getting through to the system?

response Partially Accepted

GM1 to 10(2) has been simplified and all discussion of activation is now in 10(5).

Activation starts the provision of U-space services. The text attempts to generalise the two cases, that this is because the aircraft takes off into the U-space airspace or because it flies into the U-space airspace.

change to text Yes

comment **AMC1 Article 10(5) UAS flight authorisation service**

The expression 'without unjustified delay' is interpreted in line with ASTM F38 'Standard Specification for UAS Service Supplier (USS) Interoperability', Too directive for a GM.

Proposal : "A possible interpretation of the expression 'without unjustified delay' is mentioned in ASTM F38 'Standard Specification for UAS Service Supplier (USS) Interoperability',"

response Accepted

change to text Yes, added in the GM

comment **AMC1 Article 10(5) UAS flight authorisation service**

"operator does not activate a flight authorisation" should be replaced with "operator does not request the activation of a flight authorisation"

response Partially accepted.



change to text	The wording is now “If no activation request has been received for a flight,”
	yes
comment	<p>AMC1 Article 10(5) UAS flight authorisation service</p> <p>The USSP should be able to demonstrate that activation requests are answered in a non-discriminatory basis and that there is no link to the UAS operator or class of operations.”</p> <p>At this point, an attempt seems to be made to prevent abuse, which is basically to be welcomed. However, the question arises as to what happens to UAS operators who provide themselves with U-space services. Furthermore, it would be helpful if the aspect of possible abuse were considered throughout.</p>
response	<p>Noted</p> <p>The paragraph has been removed as it is not needed as AMC. The competent authority is already responsible for monitoring the functioning of U-space</p>
change to text	Yes
comment	<p>AMC1 Article 10(6) UAS flight authorisation service</p> <p>(a) What is meant with "in an incremental way"?</p> <p>(b) The failover case should be defined globally at least in principle, i.e. not between every USSP individually. Otherwise it will be much harder to verify that it actually works.</p>
response	<p>Noted</p> <p>The text has been considerably revised to address this comment and others.</p> <p>“in an incremental way” was intended to explain that the arrangements would withstand additional USSP joining the arrangement, or USSP leaving. The item is removed</p>
change to text	Yes
comment	<p>AMC1 Article 10(6) UAS flight authorisation service</p> <p>Service levels and considerations of a failure of a USSP need to be defined by the MS, as part of performance requirements for the U-Space airspace, and not subject to USSPs agreement. Delete this bullet.</p>
response	Partially accepted



	The text has been considerably revised to address this comment and others. Some element of the original remains in that the arrangements between USSP should be robust against the defect of one of the participants.
change to text	Yes
comment	<p>AMC1 Article 10(6) UAS flight authorisation service</p> <p>Comments: Section 2.3.11 on GM1 to Article 10(6) mentions that “the ASTM standard (F38 ‘Standard Specification for UAS Service Supplier (USS) Interoperability’) is expected to be widely used.” We recommend that AMC1 Article 10(6) adds a paragraph to require compliance with the ASTM standard (WK63418) in how conflicting UAS flight authorisation requests are resolved to ensure interoperability between USSPs.</p> <p>Rationale / Justification: Harmonization across Member States requires member states to use a common standard, and ASTM WK63418 is mature and has been developed with significant input from industry. Harmonization of UAS flight authorization is important to enable cross-border operations. Hence compliance with the standard should be required.</p>
response	<p>Partially accepted.</p> <p>The standard is now mentioned in GM</p>
change to text	Yes
comment	<p>AMC1 Article 10(6) UAS flight authorisation service</p> <p>Item (a) is essentially a repetition of the text of the regulation. It would be interesting to know according to which criteria one application should be given priority over the other.</p>
response	<p>Partially Accepted</p> <p>The text has been considerably revised to address this comment and others.</p> <p>“in an incremental way” was intended to explain that the arrangements would withstand additional USSP joining the arrangement, or USSP leaving.</p>
change to text	Yes



comment	AMC1 Article 10(6) UAS flight authorisation service Item a) Alternatively, arrangements can be made via the CISP.
response	Not accepted The regulation only mentions the CISP as the provider of CIS, as defined in article 5. This AMC/GM does not contradict the regulation.
change to text	No

comment	AMC1 Article 10(6) UAS flight authorisation service The NPA foresees that, in case of conflicting flights, two or more USSPs make bilateral arrangements for how to resolve such conflicts. It is unclear what the purpose of these bilateral arrangements is. Taken literally, such bilateral arrangements seem unnecessary given the global first-come-first-serve rule described in Article 10(9). The reason for this is that, if first-come-first-serve should always hold globally, then USSPs would not need to make additional bilateral arrangements beyond the simple ability to check if there exists a conflict. If the idea of these additional arrangements is to potentially improve the efficiency, fairness and incentives of how the airspace is allocated to UAS operators by deviating from a global first-come-first-serve constraint, then our concern is that these bilateral arrangements may likely (whether intended or not) lead to inefficiencies, unfairness, and bad incentives, and they may also scale badly to a larger number of USSPs. Furthermore, audits (as described in GM1 Article 10(6)(a)(3)) may not reveal the true extent to which a mechanism fails to be efficient, fair, or provide good incentives (see our response further below on GM1 Article 10(9)(c)). Solution proposals: <ol style="list-style-type: none"> 1. Clarify the intended purpose of these bilateral arrangements, in particular, whether they are supposed to allow deviations from a global first-come-first-serve constraint. 2. Consider a more regulated conflict resolution mechanism that ensures desirable properties including efficiency, fairness, good incentives, and scalability. In our view, such a mechanism would ideally be implemented in a centralized way, under the supervision of the competent authority (see our paper referenced above for more details).
response	Noted As it is correctly pointed out, the arrangements between USSP are necessary for 1) the detection of conflicts and 2) the establishment of which was first to file in order to implement the global first-to-file-has-priority requirement. The requirement can be met (sufficiently well) by following ASTM standard F3548-21. First-to-file-has-priority is in the current version regulation in 10(2)(b) and 10(9) and hence the AMC-GM cannot propose



	<p>otherwise, however it may be that this scheme is reviewed in later versions of the regulation. Similarly if the audit mechanism is found to be insufficient, the regulation might later be updated. It would be highly unusual for AMC/GM to anticipate changes to the regulation for which it was written.</p>
change to text	Yes
comment	<p>AMC1 Article 10(6) UAS flight authorisation service</p> <p>"The arrangements between USSPs ... to deal with the specific case." should be replaced with "If a USS fails entirely and cannot support strategic coordination, the arrangement between USSPs should set service levels and allow other USSPs to plan over accepted flights managed by the failed USSP. In that regard, the terms and conditions associated with the flight should incorporate provisions to deal with the specific case."</p>
response	<p>Not Accepted</p> <p>At this early stage of the implementation, the robustness of this feature is not demonstrated, and may result in unsafe condition.</p>
change to text	Yes
comment	<p>AMC1 Article 10(6) UAS flight authorisation service</p> <p>Further explanation, even dedicated GMs, about how USSPs providing services in the same U-Space Airspace will de-conflict authorization requests between them.</p>
response	<p>Partially Accepted</p> <p>GM1 to 10(6) now refers to ASTM F3548-21 in line with this and similar comments.</p>
change to text	Yes
comment	<p>AMC1 Article 10(6) UAS flight authorisation service</p> <p>Item (a) How could it be harmonised ?</p>
response	<p>Accepted</p> <p>GM1 to 10(6) now refers to ASTM F3548-21 in line with this and similar comments.</p>
change to text	Yes



comment	<p>GM1 Article 10(4) UAS flight authorisation service</p> <p>There are explicitly no geofencing actions for intrusive non-acknowledged UAS which confound the calculated U-space mentioned.</p>
response	<p>Noted</p> <p>The comment seems to relate to emergency actions for intruders. Hence it is in the same spirit as article 10(10). The basic problem is the processing of restrictions. Every conceivable restriction on where a UAS can fly can always be matched by some set of circumstances in which flight should be allowed in that case. The general model of a restricted area is that it is an area for which there is an authority that can exclude or allow flights. What is missing (unfortunately) is any way in Annex iv to indicate whether appropriate permission has been obtained. Hence the options are a) always exclude and b) never exclude but always warn. The second approach was followed. (Currently there is no general mechanism to express that permission has been obtained. The requirement is that the authorisations be readable and trustworthy.)</p>
change to text	Yes

comment	<p>GM1 Article 10(4) UAS flight authorisation service</p> <p>This requirement may be rather difficult to fulfil in the context of the SORA. Namely, SORA may result in specific spatial or temporal limitations for the UAS operation (e.g. not in certain geo areas, or not at certain times of the day), aimed at mitigating the ground risk, while USSP will look exclusively into the air risk mitigation, and would normally not have the knowledge of the related ground-risk constraints.</p> <p>Where USSP may help is if the operator submits a desired timeframe for the operation (e.g. 20 min flight any time within an hour), and USSP may determine the exact timing of the operation that would ensure no conflict with other operations. In spatial dimension, it would be nearly impossible for the USSP to make any suggestions, for the ground risk considerations mentioned above.</p>
response	<p>Partially Accepted</p> <p>The comment is valid. The phrase "and support the planning of an acceptable alternative" is perhaps too optimistic. The USSP might be able to make suggestions of conflict free alternatives in some cases; the USSP is likely to do this by testing simple variants of the unacceptable plan (e.g. same plan, later take off); the conflict free variants would then be proposed to the operator who would be responsible for choosing one that they find acceptable, or using these as the basis of another plan. The reason this is mentioned is in the past UAS operators have expressed the view that their operation plans are commercially sensitive. Hence it is not expected that the UAS operators will be given a full view of all the other flights. They will simply learn about those parts of flights which conflict with their own authorisation requests.</p>



change to text	Yes
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comment	<p>GM1 Article 10(4) UAS flight authorisation service</p> <p>USSPs could develop a system that records ignorance by UAS operator when warnings are given. Too many violations could lead to a temporarily ban from the services, and in the future even fines.</p>
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response	<p>Partially Accepted</p> <p>The competent authority is expected to monitor the actions of UAS operators. USSP are required to record their approvals - see AMC1 Article 10(1) - hence it will be possible to discover that a warning was given and a UAS operator knowingly flew into an airspace for which they did not have permission. AMC/GM are added to Art 7, 10.</p>
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change to text	Yes
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comment	<p>GM1 Article 10(4) UAS flight authorisation service</p> <p>The USSP and/or CISP should deploy means of coordination among UAS Operators and authorities.</p>
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response	<p>Noted</p> <p>It would be interesting that a coordinated approach is established to granting permission to enter an airspace and to indicating that permission has been granted. It is beyond the scope of this AMC-GM.</p>
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change to text	No
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comment	<p>GM1 Article 10(4) UAS flight authorisation service</p> <p>There is a contradiction here when it is said that “only warnings will be given regarding airspace access”. Indeed, the GM1, article 10, General, (c) states that “this service covers the flight authorisation provided according to Article 15(1) of Regulation (EU) 2019/947”. Therefore, it covers potential authorisation request for airspace access. The both GMs shall be aligned to cover Article 15(1) requirements.</p>
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response	<p>Noted</p> <p>The content is aligned with the Annex iv.</p>
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change to text	Yes
comment	<p>GM1 Article 10(4) UAS flight authorisation service</p> <p>In relation with paragraph (b) of GM1 Article 10(4), it is considered correct that UAS operator remains responsible for acquiring any necessary access permissions. But that responsibility should be considered without detriment of the responsibilities that could have the UAS flight authorisation service, in particular the obligation established in Article 10(7) of this EU Regulation.</p>
response	<p>Accepted</p> <p>The GM for 10(2), 10(5) and 10(7) has been revised as a result of this and similar comments.</p>
change to text	Yes
comment	<p>GM1 Article 10(5) UAS flight authorisation service</p> <p><u>Comments:</u> Please provide a clarification on what is meant by 95% in the context of “The expression ‘without unjustified delay’ is interpreted in line with ASTM F38 ‘Standard Specification for UAS Service Supplier (USS) Interoperability’, which requires that flight authorisations are activated within 5 seconds, 95 % of the time.” Specifically over what time horizon or how many operations is this measured on?</p> <p><u>Rationale / Justification:</u> As written, this requirement is not enforceable/verifiable without specifying the time period to perform this measure. Specifying a timeframe for measurement the 95% requirement will provide more clarity to USSPs and operators on how it can be met.</p>
response	<p>Not Accepted</p> <p>This GM is expressed in a similar way to the other requirements. The USSP may develop justification.</p>
change to text	Yes
comment	<p>GM1 Article 10(5) UAS flight authorisation service</p> <p>Please add ASTM standard publishing date and version number.</p>
response	Accepted



	ASTM F3548-21 identifies one version, published in 2021. Currently F3548-21 is the only version of the standard.
change to text	Yes
comment	GM1 Article 10(5) UAS flight authorisation service Comment: The performance (<5s, 95%) can only be met if it is not involving ATC or another drone-zone administrator. The USSP may then let the status change to "Pending" (while the coordination with e.g. ATC takes place).
response	Noted.
change to text	No
comment	GM2 Article 10(5) UAS flight authorisation service why not offer the other services beforehand? This would make sense, for example, in the context of flight preparation for the traffic information service and the weather information service.
response	Noted. The approach is that the U-space services mentioned are delivered via a web service to a computer (smartphone, remote piloting station, call it what you will). There needs to be some "session" started to allow the services associated with an authorised (planned) flight to be delivered to a particular computer. This session starts with some authentication process that links the computer and the flight. This process is the activation performed by the operators. Activation comes before flight, deactivation after.
change to text	No
comment	GM2 Article 10(5) UAS flight authorisation service If the flight authorisation is withdrawn because it is found to be in conflict..." - It is suggested to keep using the established terminology with Network Manager IFPS and substitute "Withdrawn" by "Rejected due to reauthorization"
response	Not accepted



	<p>There is a crucial difference between rejected and withdrawn. If a flight authorisation request is rejected, that happens almost immediately after it is submitted. There is never a doubt that it may have been authorised. The change to withdrawn status comes later when the flight has previously been authorised and has a unique identifier. There is a much higher risk of a UAS operator attempting to activate or fly a withdrawn flight than a rejected one. Thus as a contingency measure, it is possible that withdrawn flight will be retained in the system until such time as the flight would have been over had it occurred. Hence no to the proposal but some explanation can be added</p>
change to text	No
comment	<p>GM2 Article 10(5) UAS flight authorisation service</p> <p>Par. (b) states, that a USSP should respond negatively to an activation request when the flight authorisation is found to be in conflict with a manned aircraft known or believed to be in a state of emergency. However, manned aircraft always have priority even without a state of emergency! They are not aware of surrounding UAS traffic and don't receive traffic information. Outside controlled airspace, there is not even a possibility for dynamic reconfiguration to solve such a conflict.</p> <p><u>Proposed change</u> "(...) be in conflict with a higher-priority flight authorisation or a manned aircraft, then the USSP should respond negatively to the activation request."</p>
response	<p>Accepted</p> <p>The "in emergency" part was a reference to article 10(10).</p>
change to text	No
comment	<p>GM2 Article 10(5) UAS flight authorisation service</p> <p>This seems redundant, as the USSP is required by regulation to provide the mandatory services at all phases of operations.</p>
response	<p>Not accepted</p> <p>Services like network identification and conformance monitoring only operate during the "active" phase of the flight. Not before and not after. Likewise the plan only describes the active phase of the flight. The lifecycle of the plan include a period before the active phase of flight (between filing the authorisation request and activation) and a period after (see the sections on recording and auditing.)</p>
change to text	No



comment	GM2 Article 10(5) UAS flight authorisation service What about a dynamic airspace reconfiguration in the cases where it is applicable? Provide clarification and consider extending the conditions for withdrawal if applicable.
response	Accepted Clarifications are provided.
change to text	Yes

comment	GM1 Article 10 (7) UAS flight authorisation service A UAS flight in restricted airspace is therefore not controlled by the USSP and the operator is not only obligated to obtain permission to fly there, but also to inform any and all airspace users (e.g. police, HEMS).
response	Noted Within U-space airspace there may be restrictions, such as prior permission being needed, or zone to be avoided. It is still U-space airspace.
change to text	No

comment	GM1 Article 10 (7) UAS flight authorisation service GM should recognize the "permissibility" of the conflict between an operational intent volume and an airspace restriction. Namely, an airspace may indeed be restricted, but for a particular UAS operation, it may be permissible to penetrate such airspace. It should be possible to indicate the potential for this permissibility of the conflict through the attributes in the flight authorisation request, and through the attributes of the airspace restriction (e.g. an airspace volume would have an attribute "restricted to all except operations performing the mission x; and the flight authorisation request would have an attribute "performing the mission x".
response	Not accepted This exact point about the inability to indicate in annex iv that a flight has permission has been discussed. The regulation takes precedence and the AMC/GM does not contradict it.
change to text	No

comment **GM1 Article 10 (7) UAS flight authorisation service**



	<p>Different stakeholders that grant permissions should be in the Authorisation Service similar to the FAA’s LAANC and be part of the data interchange with USSPs and CISP.</p> <p>The UAS operator is responsible for obtaining the appropriate permissions to enter any restricted airspace, or to not enter the airspace if that permission has not been obtained. These permissions could be obtained as part of the interchange with USSP and CISP.</p>
response	Partially accepted. The GM has been revised slightly.
change to text	Yes
comment	<p>GM1 Article 10 (7) UAS flight authorisation service</p> <p>a) " the UAS flight authorisation service can NOT reject" would make sense in the context of the sentence.</p>
response	Partially accepted. That “can” was a typing error. The GM has subsequently been revised
change to text	Yes
comment	<p>GM1 Article 10 (7) UAS flight authorisation service</p> <p>Only for restricted airspace is included. Other types Dangerous, Prohibited, TSA, TRA, etc are missing. Details should be provided/added.</p>
response	<p>Noted</p> <p>The term is used specifically. Restricted areas in the current aeronautical publications have associated restrictions which come from legal authority being exercised. Danger areas are completely different, in that in many countries there is not a legal prohibition on entering a danger area; the publication is a warning that doing so may result in injury or death.</p>
change to text	No
comment	<p>GM1 Article 10 (7) UAS flight authorisation service</p>



It is said that a reason to reject a flight authorisation request could be an expected use of restricted area for which there is no assurance that UAS has permission. Additionally, it is up to the UAS to obtain this permission.

We consider that, with regard to article 15 of the Regulation (EU) 2019/947, the discrepancies are two folds here :

- A restricted area is not closed to UAS per nature but only because of the existence of a specific UAS geographical zone defining conditions to access
- Stating that UAS operator has to request access to the “restricted zone” is not consistent with GM1, article 10, General, (c), stating that flight authorisation “service covers the flight authorisation provided according to Article 15(1) of Regulation (EU) 2019/947”.

The GMs shall be aligned to cover Article 15(1) requirements.

response Partially accepted

The 2021/664 is complementary to, extend, the 2019/947. The definition of the U-space airspace including sub geo-zones that may be part of it, are made available part of the CIS. Fly crossing “No fly” zones should be straight rejected, while the awareness of the operators should be raised when crossing restricted zones and acceptance pending on the confirmation that he has been granted with the proper authorisation.

The AMC/GM to Art 10 are clarified, as those to Art 6.

change to text Yes

comment **GM1 Article 10 (7) UAS flight authorisation service**

Perhaps there is a missing requirement here: how can an UAS operator receive an authorization following receiving permission to enter a restricted airspace if there is no way to let the USSP know about it?

response Partially accepted.

It is indeed the responsibility of the operators to obtain the restrictions. The AMC/GM to Art 10 are clarified, as those to Art 6. The acknowledgement of the terms and conditions are meant to record the confirmation of the operator that he has the authorisation.

change to text Yes

comment **GM1 Article 10 (7) UAS flight authorisation service**

Strike item (b). Proposed to be deleted since not related to the UAS flight authorisation service but UAS remote obligations covered under Annex of (EU) 2019/947.



response	Partially accepted. The 2021/664 complements the 2019/947.
change to text	No
comment	<p>GM1 Article 10 (7) UAS flight authorisation service</p> <p>Comment:</p> <p>The UAS Flight Authorisation service shall be able to reject any authorisation when detected that the operation overlaps a restricted airspace without permission. Certain deployments may include additional authorities in the loop of Flight Authorizations and enable such authorities to participate in permission granting (when necessary). CIS platform could enable the participation of such additional authorities. INDRA suggest to enable this additional functionality.</p> <p>Suggestion:</p> <p>(a) The UAS flight authorisation service can reject the authorization when the flight penetrates a restricted airspace. In case the platform is not able to know that the UAS operator has already obtained permission to enter a restricted airspace, hence UAS flight authorisation service can only inform the UAS operator that permission is required. In the case CISP enables additional interface or information to enable permission granting for the authorities managing the abovementioned restricted airspaces, UAS flight Authorization service may use this interfaces to grant permissions including the restricted airspaces.</p>
response	<p>NOT ACCEPTED</p> <p>It is not the role of the Single CISP to be involved in the flight authorisation. However the geo information should be made available as part of the CIS.</p>
change to text	No
comment	<p>GM1 Article 10 (7) UAS flight authorisation service</p> <p>(a) in such a case as described rejection should not be the default action from the USSP. Such a request should, via the single CISP if available, be forwarded to the entity responsible for the restricted airspace for an approval or rejection.</p>
response	<p>Not accepted</p> <p>The proposal does not fit the current U-space approach. The access is restricted to conditions and approval that only the UAS operators can obtain.</p>
change to text	No



comment	AMC1 Article 10(7) UAS flight authorisation service If a quick change in airspace demand is required, an airspace restriction need to be acknowledged by the UAS operator. Consider adding the requirement on the UAS-operator.
response	Partially accepted DAR will result in urgent warnings to operators. Acknowledgement is a good idea.
change to text	No
comment	AMC1 Article 10(7) UAS flight authorisation service U-space operations without a CIS are allowable and an alternate reference for the source of airspace restriction data should be provided.
response	Not Accepted 2021/664 article 5(1) refers to "the common information services of each U-space airspace.", this repository of information is required, for instance to get the geo information. Operations may happen without <u>Single Common Information Service Provider</u> . The flight authorisations should not be managed by the Single CISP, but by the USSP which need to agree on the way to ensure robust synchronisation of the flight authorisation.
change to text	No
comment	GM1 Article 10(6) UAS flight authorisation service The introduction of a specific time limitation may be misleading here. The main goal is to detect the conflicts as soon as possible and the 'less than 15 seconds' being the only example may cause confusion. It is suggested to delete this example from the GM and adding a clear indication of what should be taken into account when granting an operating certificate, keeping in mind that the time should be as quick as the current technological development in this area allows.
response	Partially accepted The example has been removed. There should be a reference to ASTM F3548-21
change to text	Yes



comment	GM1 Article 10(6) UAS flight authorisation service Scenario: U-space in country A has two USSP, one certified in member state B, one in member state C. Which competent authority may audit the 'propriety' of these arrangements between USSPs?
response	Partially accepted The AMC/GM have been revised to clarify the 'propriety' to be assessed. The oversight of the USSP and assessment of the fair and effectiveness usage of the U-space airspace are different activities. It is assumed that the assessment of the use of the airspace will be performed by the competent authority in charge of the U-space designation.
change to text	Yes

comment	GM1 Article 10(6) UAS flight authorisation service Comment: The NPA foresees that, in case of conflicting flights, two or more USSPs make bilateral arrangements for how to resolve such conflicts. It is unclear what the purpose of these bilateral arrangements is. Taken literally, such bilateral arrangements seem unnecessary given the global first-come-first-serve rule described in Article 10(9). The reason for this is that, if first-come-first-serve should always hold globally, then USSPs would not need to make additional bilateral arrangements beyond the simple ability to check if there exists a conflict. If the idea of these additional arrangements is to potentially improve the efficiency, fairness and incentives of how the airspace is allocated to UAS operators by deviating from a global first-come-first-serve constraint, then our concern is that these bilateral arrangements may likely (whether intended or not) lead to inefficiencies, unfairness, and bad incentives, and they may also scale badly to a larger number of USSPs. Furthermore, audits (as described in GM1 Article 10(6)(a)(3)) may not reveal the true extent to which a mechanism fails to be efficient, fair, or provide good incentives. Solution proposals: <ol style="list-style-type: none"> 1. Clarify the intended purpose of these bilateral arrangements, in particular, whether they are supposed to allow deviations from a global first-come-first-serve constraint. 2. Consider a more regulated conflict resolution mechanism that ensures desirable properties including efficiency, fairness, good incentives, and scalability. In our view, such a mechanism would ideally be implemented in a centralized way, under the supervision of the competent authority (see our paper referenced above for more details).
response	Noted



	The bilateral agreements are not (as hypothesised) to ensure fairness but rather to ensure reliable and timely functioning. Fairness is desirable but beyond the scope of this regulation. It is expected that a standard method will be used (ASTM F3548-21) and the bilateral agreement will describe procedures and responsibilities in normal situations and in case of problems.
change to text	No

comment	GM1 Article 10(6) UAS flight authorisation service
	To avoid situation in which two FA are approved by two different USSPs, it may add a delay (30 seconds) in which every USSP check again if there are other FA coming from CIS and approved by another USSP. During this time, UAS operator must wait after he select on the USSP platform “activate”. I think it must be done in the strategic phase and it’s a small waste of time from the UAS operator, but a secure check to be done to the safety of all the users
response	Noted The ASTM F3548-21 standard explains in detail how to solve the problem. The flight authorisations are not coming from the CIS, but exchanged between USSP.
change to text	No

comment	GM1 Article 10(6) UAS flight authorisation service
	As it is written it seems that the CA has an active tactical role in case of conflicting authorizations. We understand, if there are continuous conflicts, CA should take actions during the monitoring process to the certified providers. Clarification needed.
response	Noted The Competent Authority has no tactical role but is responsible for certifying the USSP then monitoring their performance. In this monitoring the CA may study recordings made by the different USSP systems.
change to text	No

comment	GM1 Article 10(6) UAS flight authorisation service
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	<p>Paragraph (a) of GM1 Article 10(6) uses the term ‘competent authority on common infrastructure’, but this term is not used in Regulation 139/2014 and its AMC/GMs, in Regulation 2017/373 (and its AMC/GMs), in Regulation 2018/1139 (and its AMC/GMs), or in Regulations 2019/945 and 2019/947 (and their AMC/GMs), or in the same U-Space Regulations and their AMC/GMs.</p> <p>It is considered that it could be more convenient to use another term, clearly explaining who is considered as a competent authority on common infrastructure.</p>
response	<p>Noted</p> <p>The text of (1) is "agreement between USSPs and the competent authority on common infrastructure" which really means "agreement on common infrastructure between USSPs" and how the CA views that agreement.</p>
change to text	No

comment	<p>GM1 Article 10(6) UAS flight authorisation service</p> <p>Please clarify, if the competent authority of the U-Space or the competent authorities for all the USSPs in that U-Space is meant.</p>
response	<p>Noted</p> <p>In the case that there are multiple competent authorities involved, it should be clear between them which is responsible for certifying and monitoring the performance of the USSPs.</p>
change to text	No

comment	<p>AMC1 Article 10(8) UAS flight authorisation service</p> <p>This article references the ‘withdrawal’ Article 10 (2) (c) references the ‘rejection’ and the need to specify a reason for the rejection.</p> <p>Clarify the terms ‘withdrawal’ and ‘rejection’ and if needed add to specify the reason for the withdrawal to the UAS operator. For these type of status, another term could also be more appropriate, like ‘temporary suspended’ or ‘slot revised’ so the operator knows that the flight is not rejected as such, but on hold till the emergency is over</p>
response	<p>Partially Accepted</p> <p>The comment is correct. Rejection occurs as an alternative to acknowledgement. A rejected request is not given a unique ID. After a flight authorisation request has been acknowledged, it has a unique ID. Hence changing its state to "not able to fly" is not exactly the same as the state it would be in after rejection. Hence a different term is</p>



	<p>used, "withdrawn." Support for this term comes in article 10(10) which mentions the verb "withdraw." Suspended is a term that implies a temporary blockage. Suspended might be a better term if the regulation (664) had made clear that there is an update process that would allow the UAS operator to modify a flight authorisation request. Such an update might render a suspended request authorised again.</p>
change to text	Yes
comment	<p>AMC1 Article 10(8) UAS flight authorisation service</p> <p>What happens if already activated? For example add: "If the flight is already activated, the authorisation request of the special operation is withdrawn"</p>
response	<p>Partially accepted</p> <p>It has been the subject of considerable discussion whether withdrawing the authorisation of an active flight is safe. The AMC/GM are clarified.</p>
change to text	Yes
comment	<p>AMC1 Article 10(8) UAS flight authorisation service</p> <p>What about a conflict with a MANNED aircraft conducting a special operation? Only UAS vs UAS is addressed in the AMC.</p>
response	<p>Noted</p> <p>Both have priorities but, the manned case is covered by 10(10).</p>
change to text	No
comment	<p>AMC1 Article 10(8) UAS flight authorisation service</p> <p>It needs to be ensured that such cases with "special operations" are happening only under specific and determined circumstances. UAS operators need certainty that the approvals for the flights they apply to are not lost. This would also represent additional burden and costs for operators that are very often small players. An alternative proposal would be to delay the operation to a later time, instead of withdrawing the approval and starting the authorisation process from the beginning.</p>
response	<p>Noted</p> <p>The comment essentially raises two questions.</p>



1) How frequently will non-priority operations be withdrawn due to priority operations?
2) Is there any way to avoid that a flight whose authorisation is withdrawn loses its filing time-based priority defined in 10(9).

Answering the first is impossible. The expectation is that such events will be infrequent. (On the roads we have a similar two-level prioritisation scheme; flashing blue light and not. There is no need for a multi-level prioritisation because flashing blue light traffic is quite rare. We might take from the implication that in U-space there are only two levels, that a similar rarity is expected.) It should be noted that articles 10(10) and 4 will also have a similarly disruptive effect on flight authorisations... Meeting the request of the second question would require a way to link a new flight authorisation request to a previous one. Annex iv offers no such facility. Or an update procedure could be invented, but that is probably beyond the scope of the AMC/GM - if the flight authorisation request is included in the text of the regulation itself, why isn't the update request? Hence, sadly, the second request cannot be met without a revision of the regulation.

change to text No

comment **AMC1 Article 10(9) UAS flight authorisation service**

The prioritization model may be too simplistic. For instance, in modern ATM, the allocation of slots (e.g. at the airport or trans-continental flights) is much more complex. Similar mechanisms might be needed for highly congested areas. If possible, suggest to allow for such models once the "first-come, first-served" model starts to fail.

response Not accepted

The priority model is on purpose meant to be simple but might be revised in the near future as experience is gained and questions of fairness arise. In any case the priority model is in the regulation and the AMC/GM are align with it.

change to text No

comment **AMC1 Article 10(9) UAS flight authorisation service**

The IR stipulates the "first-come-first-serve" principle, while the AMC here only elaborates one of several possible ways of interpreting this principle. Namely, the same principle may be interpreted as "the first to start the operation" (rather than "the first to have submitted a plan"), or "the first to arrive at the conflicting point" (although, possibly, having started the operation later).

The interpretation that the AMC here promotes favours specific types of UAS missions - regular, predictable and not heavily dependent on weather conditions (e.g. scheduled transport of goods), over the non-predictable ones or those depending on specific



weather conditions (e.g. unplannable maintenance work or aerial screening, possible only in clear skies).

Another essential element for the protection of the fair and equitable access to the airspace is ensuring the accurate planning and execution of the planned operations. Namely, MS should introduce mechanisms to prevent excessive planning that does not correspond to actual operational intentions, just in order to book the airspace.

Suggested Solution:

AMC and GM should provide more detailed guidance on managing the authorisations having the same priority. Additionally, AMC/GM should include guidance for MS and USSPs to prevent excessive planning versus underperformed operation, aimed at obtaining privileged status in priority allocation.

response

Partially accepted

The remark makes some good points, many of which were discussed in the production of the AMC/GM. What is "first come" has not been invented by the AMC/GM team but rather is the implication of article 10(2)(b). That article states that when a new request is received, there is a check that it does not intersect with any previously authorised request. This is explicitly a prioritisation of "first to request authorisation" rather than any other interpretation of "first come." (more below) The comment is right, that the resulting prioritisation will systematically disadvantage UAS operators in businesses such as food delivery. It is expected that as experience is gained with U-space, issues such as fairness will drive a reconsideration of this prioritisation. However at this time, there is no other scheme which is considered more fair and mature enough to be put into law. The GM can easily give an example of what is foreseen. (more on the previous point) HOWEVER there is quite a big problem here. Article 10(6) requires the USSP make "proper" arrangements between themselves to solve these problems. Article 10(2)(b) Explains that a new flight authorisation request should be rejected if it intersects with an already approved request and 10(9) mentions first come first served. The purpose of 10(9) is to complement 10(8) which mentioned the special case. 10(9) really means "otherwise do as 10(2)(b)." However it muddies the water by generalising the requirement. We can only practically implement the text described in 10(2)(b) that new requests are compared with approved requests. Cases when conflicting requests are received within milliseconds of each other are expected to be so rare not considered to be worth dealing with by building dedicated machinery to compare request timestamps. A significant revision of both the AMC and GM for 10(9) has taken place to limit expectations to this "do what is practical."

change to text

No

comment

AMC1 Article 10(9) UAS flight authorisation service

Which timestamp applies? The registered times of receipt at the USSP cannot apply, as requests can be received by different USSPs at the same time. USSP have to negotiate



	<p>consensus on the order of requests. Technical solutions are e.g. use of vector clocks, or a central token service.</p>
response	<p>Partially accepted</p> <p>The prioritisation scheme is derived from article 10(2)(b). That article states that when a new request is received, there is a check that it does not intersect with any previously authorised request. The details about how exactly to do this are to be established by the USSPs in their "proper arrangements" mentioned in 10(6). USSPs are encouraged to look at standard solutions such as ASTM F3548-21. Questions may remain and will need to be solved by the USSPs; 10(2)b clearly indicates that an incoming flight authorisation request has to be compared with already approved requests. There may be a race between two requests arriving closer in time than the amount of time taken to approve one. The proposals listed are reasonable.</p>
change to text	Yes
comment	<p>AMC1 Article 10(9) UAS flight authorisation service</p> <p>Wouldn't it make sense, in the sense of harmonised rules, to set a guideline for this that everyone follows? Otherwise, there is a high probability that there will be different procedures in the different U-space airspaces.</p>
response	<p>Partially accepted</p> <p>The AMC and GM for 10(9) has been extensively revised. The logic to implement is that of 10(2)(b) with a practical limit on what can be achieved. If there is a finite time between receiving and approving a flight request, another request arriving during that time need not be processed in accordance with the requirement of 10(9) so long as such cases are rare.</p>
change to text	Yes
comment	<p>AMC1 Article 10(9) UAS flight authorisation service</p> <p>Point (a) The terms "whichever the later" are confusing because it is not clear to what part of the sentence they apply, Considering that "an update" will always come after " a submission", one is wondering if that applies to the order of priority, where "later" is not logical.</p> <p>Remove the terms "whichever is later" at the end of the sentence or reconsider the whole wording of the sentence.</p>



response	Partially accepted The AMC and GM for 10(9) has been extensively revised to allow a practical implementation.
change to text	Yes
comment	AMC1 Article 10(9) UAS flight authorisation service An active UAS flight should not be rejected as a result of the UAS operator making an update to that flight. Comment: Depends, if the plan is changed such that it interferes with other planned operations of higher priority or if it interferes with other already active drone operations.
response	Partially accepted The AMC and GM for 10(9) has been extensively revised to allow a practical implementation.
change to text	Yes
comment	AMC1 Article 10(9) UAS flight authorisation service There is a need for a more elaborated Priority, e.g. firefighting is more important than traffic surveillance. Also which Priority can be assigned to UAM (manned, not piloted) or HEMS. The Priority should be defined by the Member State (per U-space?). Where/how can the priority of the operation be selected/validated ? The MS should make a list of priorities (0-255) for special operations.
response	Not accepted The expectation is that priority flights will be infrequent and hence (in the regulation) two levels of priority are enough (On the roads we have a similar two level prioritisation scheme; flashing blue light and not). There is no need for a multi-level prioritisation because flashing blue light traffic is quite rare and there is a very seldom a situation in which two flashing blue light vehicles contend which cannot be resolved sufficiently well by some other means such as random choice.) We might infer that in U-space, as there are only two levels, priority flights are also expected to be infrequent. As for the suggestion of 255 priority levels, the relative priority of different flights may depend on the situation, would require an unreasonable amount of information about each flight to be revealed, and would require some gradation that could be challenged. In any case the regulation says there are two levels of priority and the AMC/GM are aligned on it.



change to text	No
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p>Point (a) and (d) seem to be in conflict: If the update is a change of the trajectory that is now in conflict with another flight authorisation, then the USSP cannot accept the change.</p>
response	<p>Partially accepted</p> <p>The GM for 10(9) has been revised to allow a practical implementation</p>
change to text	Yes
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p>Item (d), this statement is in direct contradiction with the bullet a) above - when an operator updates the flight, the time reference for the process of determining the priority should be reset. This, in turn, may result in flight authorisation being rejected, as a conflicting flight would have been submitted earlier.</p>
response	<p>Partially accepted</p> <p>The GM for 10(9) has been revised to allow a practical implementation</p>
change to text	Yes
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p><u>Comments:</u></p> <p>We propose to include that in the event of an UAS operator updating an already authorised but not active plan and the existence of a conflict with the new version and other existing plans, the operator may have two options: either keep the former plan (already deconflicted) or propose an alternative.</p> <p><u>Rationale / Justification:</u></p> <p>According to GM1 Article 10(9) paragraph 9, whenever an update in the trajectory is published the time reference for the process of determining priority is reset.</p> <p>This could cause a disturbance in the event of an authorised plan that is not yet active as the operator may lose the preference of the existing authorised plan when proposing an update to the trajectory.</p> <p>Therefore we consider that in this case the UAS operator may be given the option to revert to the original plan.</p> <p>GM2 Article10 (10) only covers the case of updating an active flight authorization but we missed the case for already authorised yet inactive ones.</p>



response	<p>Partially accepted</p> <p>The text has been revised. The idea is that following the logic of 10(2)(b) an update to a plan is like a new proposal which if successful replaces the previous plan. If a plan has been authorised (hence is conflict free) it will not be removed by the update process until it is replaced by a new plan consisting of the old plan with the update applied.</p>
change to text	Yes
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p>Comments:</p> <p>It is stated that the competent authority may monitor and audit authorization and rejection. We recommend that text be added to also state that the competent authority may modify the algorithm by which flight authorizations of the same priority are handled if the implementation of first-come, first-served in AMC1 Article 10(9) is found to be inadequate in ensuring fair and equitable access to the airspace.</p> <p>Rationale / Justification:</p> <p>If the monitoring and audit by the competent authority finds that access is not fair and equitable access, there must be recourse to adapt the way flight authorizations of the same priority are handled.</p>
response	<p>Not accepted</p> <p>At this stage the first-come-first-served principle is ensuring the best fairness. A useful suggestion but it would require an update to the regulation and hence is beyond AMC/GM</p>
change to text	No
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p>There should be an obligation for the competent authority to check compliance with fair and equal access to airspace in order to sanction misconduct. Proposal to change to: “(c) The competent authority should monitor or audit authorisation and rejection data to assure fair and equitable access to the airspace.”</p>
response	<p>Partially accepted</p> <p>The regulation explicitly requires this first-come-first-served behaviour. Whether equitable access could be a reason to redefine first-come-first-served would depend on it</p>



	<p>being a legal requirement. The role and responsibilities have been clarified in the AMC/GM.</p>
change to text	Yes
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p>a) Is a change of the 4D trajectory possible if the flight is already active? Add for example: "if the flight authorisation is already active, a change of the 4D trajectory is only possible if it is conflict free with other flight authorisations."</p>
response	<p>Partially accepted</p> <p>The comment expresses the intended logic. The GM text has been clarified</p>
change to text	Yes
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p>Disclaimer:</p> <p>Many of the issues with the first-come-first-serve rule only become problematic once the airspace is sufficiently congested. This is projected to be the case in urban environments within the next 10-20 years (e.g., see a recent paper by Doole et al.: https://www.sciencedirect.com/science/article/pii/S0969699719304004). However, although the airspace is not congested <i>right now</i>, we highly recommend designing the rules already with a congested airspace in mind. Otherwise, once the airspace is congested, unsuitable rules may be in place, and those rules may be difficult if not impossible to change at that point in time, then leading to inefficiencies, unfairness, and bad incentives. Therefore, in the following comments, we assume an airspace that is sufficiently congested such that intersecting flight plans are a common occurrence.</p> <p>Comment:</p> <ul style="list-style-type: none"> As written, Article 10(9) has bad incentives, as it directly incentivizes drone operators to reserve more airspace than they need. Concretely, since there is no cost associated with making a reservation, a strategically acting operator should hurry to reserve as much airspace as they can as early as possible. Of course, U-space designers could limit how many reservations an operator can make, or how



often they can freely cancel their reservations. But such “fixes” typically have further unintended consequences that endanger the efficiency or fairness of the UTM system.

- The first-come-first-serve rule systemically disadvantages operators that, by the nature of their service, require a shorter planning horizon (e.g., short-term delivery services). Such operators may find it difficult to reserve an efficient route in a congested airspace, because operators with longer planning horizons may already have booked their routes. Given this, the first-come-first-serve rule is **unfair** in this respect.
- Because first-come-first-serve incentivizes operators to reserve airspace as early as possible, it is advantageous for operators to submit flight plans *before* they know the exact route they need, leading to **inefficient** flights.
- The problem of inefficient flights is compounded if operators need to adjust their route after they have received their flight authorization (but while the flight is not yet active). Concretely, since updating their flight plan after authorization would put them to the end of the queue, this creates incentives for operators to follow through with **inefficient** flights, because (in a sufficiently congested airspace), the alternative may mean not flying at all.
- GM1 Article 10(9)(d) and GM2 Article 10(10)(a)+(b) leave unclear what should happen when an active flight wants to update its flight plan but the update would create a **new conflict** that cannot easily be resolved without changing the other flight. It seems to us that the intent of the current regulation is that, in this case, the already active flight would not be allowed to update its flight plan. This could be **very inefficient**. For example, after flight activation, any number of conditions may change (e.g., weather conditions, customer needs, drone functionality, or any other environment variables) such that the operator might suddenly have a very high value for a new (but very specific) flight path. If this new flight path conflicts with another flight whose operator, in principle, could deviate without problem, then not allowing for updates to this flight would create an **inefficiency**. In the worst case, preventing operators from updating their flight paths may lead to a cascade of non-conforming flights.

Solution proposals:

1. Taking operator values into account to increase efficiency:

When deconflicting two or more flight authorization requests of the same priority, the UAS flight authorization service should **explicitly take into account the operators’ values for their flights**. For example, consider a large company’s routine logistics flights between their warehouses (e.g., thousands of flights every day, for the foreseeable future), which may conflict with the desired flight of a wedding photographer. Given that the company mainly values getting their drones quickly from point A to B, they have a low cost from slightly deviating from their optimal flight path for a few flights. In contrast, the wedding photographer relies on being able to fly their drone directly above the wedding venue at a specific point in time, and any deviation in time or space would be unacceptable. Thus, in this example, it would better to take the operators’ values into account (with the wedding photographer having a very high value and the company having a very low value for single flights), such that a **more efficient** allocation can be found, where the logistics flights slightly deviate from their optimal route to



accommodate the wedding photographer. Note that this requires deviating from the first-come- first-serve rule.

2. **Charging operators externality-based prices for accessing congested airspace ("conflict resolution"):**

To address the various shortcomings of the first-come-first-serve rule, one should consider **charging operators based on the externalities their flights impose on others**. Note that this would be an *additional* payment *independent* of what the USSP would charge for providing their services. The “externality” a flight A imposes on another flight B is the cost the operator of flight B incurs because flight A was approved (e.g., because the operator of flight B now has to take a worse route). Thus, if the airspace is uncongested, this externality is zero (and payments could be set to zero). However, the more congested the airspace is, the larger the externality, and thus the larger the corresponding payments would be. With such externality-based payments, the operators would be incentivized to only reserve as much airspace as they need. Since the goal of the U-space is not to maximize revenue (but to maximize efficiency, fairness, etc.), these payments should only be as high as is necessary to align incentives (which externality-based payments would be). Additionally, **these payments should not go to the USSP**, because these payments are not for services that the USSP provides. Instead, **these payments should go to the competent authority**, because the payments are just used to resolve conflicts in a congested airspace. The competent authority could decide to redistribute these payments among operators, or use them to cover certain costs that it incurs. One may worry that charging operators an additional amount for accessing the airspace to resolve conflicts may present an equity issue. The concrete concern we have heard is that operators with larger financial means might be able to consistently secure favorable outcomes to the detriment of other operators. However, having a high value for a flight and having strong financial means are orthogonal to each other! Large, financially strong operators with many flights, such as parcel delivery services, typically have very small profit margins per flight, and thus have no incentive to regularly make large payments for access to the airspace. In contrast, a financially weaker operator can still have a large value for a single flight (e.g., a wedding photographer). Thus, the typical concerns about payment-based mechanisms are unwarranted. For details, please see the discussion in our paper.

3. **Broader scope of updating flight authorizations:**

The flight authorization service should **be able to re-allocate airspace**, even when authorizations are already active and the update to a flight may **create a new conflict** with another flight. Obviously, this must possible in the case that a flight update is necessary for the stability of the system (e.g., if otherwise a drone would crash). But we emphasize that flight updates should also be possible if all affected operators can come to a mutually agreeable solution as this might greatly increase efficiency.

response Not accepted



The comment is correct. Many including those at EASA are well aware of the issue. Any fairer scheme that is to be adopted in a revision of the regulation will need to be well described, mature and broadly acceptable. There is an urgent need for research in this area and debate among the stakeholder community. The proposed solutions include some interesting ideas that may extend beyond the competence of EASA, for example pricing, which may complicate matters.

In any case the issue requires an update of the regulation (and is noted) but a solution cannot be achieved by AMC/GM.

change to text No

comment

GM1 Article 10(9) UAS flight authorisation service

Comment:

The NPA asks the USSPs for the collection of usage data, such that the competent authority can audit the data, to detect unfair or inequitable outcomes. This is a flawed approach, because by simply analyzing authorization data, it may be very hard, if not impossible, to detect that something is going wrong.

This is a problem that is known and well-studied in other practical market domains, the most famous of which may be school choice. In the *school choice problem* (e.g., work by Abdulkadiroglu and Sönmez: <https://www.aeaweb.org/articles?id=10.1257/000282803322157061> and Roth et al.: <https://www.nber.org/papers/w11965>), middle-school students are matched with places at competitive high schools. Many cities in the United States have long employed school choice mechanisms that are highly manipulable, such that it is not optimal for students (or their parents) to rank schools in order of their true preference. Many parents have learned how to optimally manipulate these mechanisms, ranking a school first that is attractive, while also being likely to accept their child. Consequently, when looking at the resulting data, it *seems* as if the vast majority of students receive their first choice, *suggesting* that the mechanism works almost perfectly, although this is not at all the case.

Similarly, it is likely that operators would learn how to optimally manipulate the first-come-first-serve rule. Without further analysis, it cannot be ruled out that many of these manipulations would remain undetected when auditing the authorization and rejection data.

Solution proposal:

We recommend that the flight authorization mechanism be re-designed, with the goal of providing good incentives to the operators, such that operators do not have any incentive to manipulate the mechanism. This could have a large positive impact on efficiency and fairness and would greatly increase the reliability of the gathered data, which may be used to further improve the mechanism in the future.

response Not accepted



change to text	<p>The comment identifies a real problem. Such a fix is beyond the scope of AMC/GM. The role of the competent authority is to assess the fair access to the airspace</p> <p>No</p>
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p>(a) This may lead to having operators activate their flight and immediately update the 4D trajectory to avoid a reset of the time reference (cf. point d).</p>
response	<p>Partially accepted</p> <p>The text has been revised. Likewise for 10(5), the AMC has been revised to limit the time window for activation to be close to the start time in the plan.</p>
change to text	<p>Yes</p>
comment	<p>GM1 Article 10(9) UAS flight authorisation service</p> <p>Depends, if the plan is changed such that it now interferes with other planned/ongoing operations. It can't be allowed that you by changing an earlier plan is able to block execution of others plans (maybe even at another USSP or having a higher priority).</p>
response	<p>Partially accepted</p> <p>The comment is valid. A re-write of GM to 10(9) should clarify what is intended.</p>
change to text	<p>Yes</p>
comment	<p>GM1 Article 10(8) UAS flight authorisation service</p> <p>USSPs should give priority to UAS conducting special operations as referred to in Article 4 of Implementing Regulation (EU) No 923/2012 which include. In case of CISP, these special operations could be coordinated by CISP with USSPs in order to grant anonymity in case of need.</p> <p>The CIS P could take up responsibility when being filed a flight authorization by one of these agents.</p>
response	<p>Not accepted</p>



The comment proposes how the Single CISP can act as USSP for state flights. This is one option but in order to follow the regulation more easily, that role might be considered as a state USSP, even if it is the same organisation that is also the Single CISP. The Single CSIP is not meant to have an active and operational role.

change to text No

comment **GM1 Article 10(8) UAS flight authorisation service**

Remark:

A special operator (e.g. an operator of medical flights) has the authorisation from the MS to use the designator of the special status and, thus, obtain a privileged treatment (e.g. priority in flight authorisation). However, such an operator may misuse that status when executing the operations not strictly linked to the purpose for which they have been granted the special operation status (e.g. a repositioning, training, maintenance flight). A service provider cannot question the declaration of the special status from the operator (that would be, plainly, dangerous); however, the MS should exercise a continued oversight role in ensuring that these statuses are only used for their intended purposes.

Suggested Solution:

GM should provide more details about how specific operators are authorised by the MS to claim special operation status; and how these operators would then indicate their special operation status within the flight authorisation request.

GM should also clarify that the verification on the correct use of these priority attributes is the obligation of the MS, and that MS may seek data from USSPs in conducting such verification.

response Partially accepted

The proposed solution is already implemented. The status of the flight mentioned in 10(8) "special operations" shall be indicated in Annex iv element 3: type of flight (special operations).

The GM has now been reworded to better draw attention to this. Whether operators will falsely claim this status is to be seen and should be audited by the competent authority. As experience grows, if this is a problem and "best practice" for dealing with it emerges, this AMC/GM can be updated.

change to text Yes

comment **GM1 Article 10(8) UAS flight authorisation service**



	SAR missions and medical flight could have the same status and should be higher classified, for instance after police and customs missions.
response	<p>Not accepted</p> <p>The current regulation allows two levels of priority: 'special operations' and 'other'. The expectation is that special operations are relatively few. If experience (audit by the competent authority) shows conflicts commonly arise between special operations flights then it might be possible to do address the situation relying on the Annex iv element 3. The definition of special operations appears in article 4 of Implementing Regulation (EU) No 923/2012 where 8 types of operation are listed. If that same categorisation were to be mentioned in Annex iv element 3, then there could be some further prioritisation within special operations, but that would be outside the regulation and the expectations of USSP, especially those operating in other EU states.</p>
change to text	No
comment	<p>GM1 Article 10(8) UAS flight authorisation service</p> <p>Comments: We propose to include a statement including which regulation “prevails” in case of future changes to Article 4 to Implementing regulation 923/2012</p> <p>Rationale / Justification: If we include the list of special operations as per Article 4 of Implementing Regulation (EU) No 923/2012 and it is changed in the future, there could be a conflict of versions. Therefore, an option could be to include which regulation prevails on this description.</p>
response	<p>Partially accepted</p> <p>The GM here was transcribed from 923/2012. To avoid confusion, that list has been deleted from the GM1 to Article 10(8) of this regulation.</p>
change to text	Yes
comment	<p>GM1 Article 10(8) UAS flight authorisation service</p> <p>The list of special operations in this section largely coincides with the cases of application that are actually excluded from the regulation (see also the recital (28) of 2021/664 and GM1 Article 1(1)). So, what is the purpose of this list? Is it to prioritise flights in case a Member State decides to apply the rules to these operations as well?</p>



response	Partially accepted The GM here was transcribed from 923/2012. To avoid confusion, that list has been deleted from the GM1 to Article 10(8) of this regulation.
change to text	Yes
comment	GM1 Article 10(8) UAS flight authorisation service It would make sense to include inspections of infrastructures after major damage events such as storms as well, since these are not only carried out by public bodies but often by private companies.
response	Not accepted Interesting idea, but it would require a change to the regulation and is beyond the scope of AMC/GM.
change to text	No
comment	GM1 Article 10(8) UAS flight authorisation service As Special Operations (either manned or unmanned) are exempted by law, it is not clear how USSPs might implement such provision. Again, exemption granted to special operations should be carefully reconsidered
response	Partially accepted The GM here was transcribed from 923/2012. To avoid confusion, that list has been deleted from the GM1 to Article 10(8) of this regulation.
change to text	Yes



comment	GM1 Article 10(8) UAS flight authorisation service What's the priority between UAS and MANNED aircraft carrying out such operations as mentioned? Only UAS vs UAS is addressed in the GM.
response	Noted Manned aircraft are not required to request U-space flight authorisation, and always have the priority on the (non special) UAS operations.
change to text	No

comment	GM1 Article 10(8) UAS flight authorisation service Police and customs missions include military and state aircraft operations, which are excluded from the scope of U-Space Regulation and therefore excluded from network ID provision. This means they are not visible for USSPs who won't be able to give them priority over other UAS operations. Therefore, it should be clarified how this paragraph is articulated with the exemption in Recital 13 of the U-Space Regulation.
response	Not accepted There may be priority flights that are excluded from the regulation that voluntarily use U-space to fly safely. The question of Network ID is not raised here; this AMC/GM are about a pre-flight process of flight authorisation.
change to text	No

comment	GM2 Article 10(10) UAS flight authorisation service (b) There should be a confirmation of the operator that he new flight authorisation is feasible, e.g. with respect to endurance, but also the mission (which may not be as simple as reaching the destination). The result of the operator cannot accepting the new flight authorisation should be defined.
response	Accepted The GM has been revised in line with this comment and similar
change to text	Yes

comment	GM2 Article 10(10) UAS flight authorisation service
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	(b) It is the responsibility of the USSP to determine the adapted 4D trajectory, and adjust the flight authorization request, correct?
response	Noted Confirm. This is what is detailed in 10(10). If the USSP does not know the manoeuvre that the UAS will make, it may simply increase the 4D volume of the authorisation as space is available to do so.
change to text	No

comment	GM2 Article 10(10) UAS flight authorisation service With relation to the point (d) Ending an active flight is an action of the UAS operator and is not expected to be performed by the USSP automatically. <u>There should be an enforcement mechanism established (on EU or MS level) to ensure that the UAS operator fulfils his obligation to end the active flight.</u> The need for such a mechanism and the possible solutions could be determined at the stage of the U-space airspace risk assessment. It is important however, that if such a mechanism is to be established it should be mandatory and universal for all USSPs providing services in the same U-space airspace.
response	Partially accepted There is a risk here of exceeding what can be captured in AMC/GM. For example we could not require that a flight plan shall not be activated if it is flown by an aircraft whose previous flight has not ended, because that would imply logic not mentioned in 10(5) or 6(5). It may be possible to advise (in GM) USSP that they could warn UAS operators about flights have gone past their planned duration and not been ended. The wording has been revised.
change to text	Yes

comment	GM2 Article 10(10) UAS flight authorisation service Do UAS operators have to communicate the end of their flights to the USSP or is the fact that they have arrived at their destination sufficient?
response	Partially accepted The UAS operator should inform the USSP that the flight has ended and by doing so indicate that the provision of services such as network identification, traffic information



and conformance monitoring can stop. Getting to the destination might not be the end of the flight, eg in case of a go-around. The wording has been revised.

AMC/GM to Art 6 have been also clarified.

change to text Yes

comment **GM2 Article 10(10) UAS flight authorisation service**

b) what would such a conflict be? With UAS or manned? For manned, there is no flight plan available, for UAS there is no withdrawal because of other authorisation requests if the flight is active.

response Partially accepted

The problems that might be detected are a) intersection of the plan with a region of airspace that due to DAR is no longer U-space airspace, b) intersection of the plan with a region that is in danger of being visited by a manned aircraft (in an emergency,...). Both of these check the plan in order to trigger short term actions. The text has been rewritten to clarify.

change to text Yes

comment **GM2 Article 10(10) UAS flight authorisation service**

With relation to the point (d) Ending an active flight is an action of the UAS operator and is not expected to be performed by the USSP automatically.

In the light of the change in this GM that occurred during the works on this regulatory package, CANSO was glad to see the deletion of the sentence: 'A flight which is active and which has exceeded its planned time plus the time in its flight deviation threshold will be "in contingency" until ended by the operator'.

Above deletion does not constitute that the active flight will not remain 'in contingency', it will still use a portion of U-space airspace or at least cause an unnecessary burden on the system. Therefore, in CANSO option there should be an enforcement mechanism established (on EU or MS level) to ensure that the UAS operator fulfils his obligation to end the active flight.

The need for such a mechanism and the possible solutions could be determined at the stage of the U-space airspace risk assessment. It is important however, that if such a mechanism is to be established it should be mandatory and universal for all USSPs providing services in the same U-space airspace.



response	<p>Partially accepted</p> <p>There is a risk here of exceeding what can be written in AMC/GM. For example we could not require that a flight plan shall not be activated if it is flown by an aircraft whose previous flight has not ended, because that would imply logic not mentioned in 10(5) or 6(5). It may be possible to advise (in GM) USSP that they could warn UAS operators about flights have gone past their planned duration and not been ended. The wording has been revised. AMC/GM to Art 6 have been also clarified.</p>
change to text	Yes
comment	<p>GM2 Article 10(10) UAS flight authorisation service</p> <p>Information on withdrawn UAS flight authorisation should also be given to the CISP.</p>
response	<p>Not Accepted</p> <p>The CISP do not need to receive the information. The comment does not explain why but it is assumed that the intention is to pass details of U-space flights back to the Air Traffic Services Unit, in both the case that the ATSU has converted some U-space airspace to not by DAR and this U-space flight is impacted, or that ATSU is aware of a manned aircraft and this U-space flight is in danger of conflict. In both cases knowledge of the U-space flight plan might be of use to the ATSU.</p> <p>The regulation implies direct communication between USSP and ATSU. At this stage only two cases are possible:</p> <ul style="list-style-type: none"> • Acknowledgement of a DAR • Non conformant UAS exiting the airspace
change to text	No
comment	<p>GM2 Article 10(10) UAS flight authorisation service</p> <p>Is this a conflict with UAS or manned aircraft operations? The nature of this conflict needs to be further defined. For manned aircraft operations, there is no flight plan available. For UAS operations, there is no conflict foreseeable, as then there would be no authorisation. So the use of this paragraph is a little unclear. Remove or clarify.</p>
response	<p>Accepted</p> <p>The GM was not very informative and has been deleted.</p>
change to text	Yes



comment

GM2 Article 10(10) UAS flight authorisation service

(b) Flight authorisations were supposed to strategically deconflict traffic. With this paragraph, flight authorisations could be used for tactical deconfliction. However, this should be a dedicated service with specific requirements. The flight authorisation seems not to be suitable for this.

Proposed change: reconsider this paragraph, traffic deconfliction service should be introduced.

(b) There is no requirement or guidance for UAS operators how they are supposed to react and in which timeframe, if the flight authorisation is altered or withdrawn. Such requirements are essential and have to be AMC.

Proposed change: additional clarification about this concept is necessary.

response

Not Accepted

Tactical deconfliction is not mentioned in the regulation. The AMC/GM cannot extend the regulation by adding more services. Further, U-space tactical deconfliction is still a subject for research.

The logic is expected to be that the UAS operator responds to traffic information as they are best able. The USSP would then attempt to enlarge the authorised volume to avoid that the UAS is considered "non conforming." The UAS operator should then recover their authorised flight plan or request a revision of it.

change to text

No

comment

GM2 Article 10(10) UAS flight authorisation service

GM2 Article 10(10)(c) should read "USSPs will notify other relevant USSPs (and single CISP where applicable) if there is an active, withdrawn UAS flight authorisation. If the UAS flight authorisation is withdrawn but active, USSPs will notify relevant USSPs (and single CISP where applicable) of the status of this operation until the end of the flight."

response

Not accepted

The CIS functions are listed in article 5. Article 10 is about U-space Services and hence USSP.

change to text

No

comment

GM2 Article 10(10) UAS flight authorisation service

"USSPs will notify other relevant USSPs if there is an active, withdrawn UAS flight authorisation. If the UAS flight authorisation is withdrawn but active, USSPs will notify



	<i>relevant USSPs of the status of this operation until the end of the flight</i> ": This is not relevant in case of centralised CIS provision architecture.
response	Not accepted The Single CISP provider as no role in the flight authorisation process. The CIS functions are listed in article 5. Article 10 is about U-space Services and hence USSP.
change to text	No

comment	GM2 Article 10(10) UAS flight authorisation service <i>"(d) Ending an active flight is an action of the UAS operator and is not expected to be performed by the USSP automatically"</i> : What does happen if the allocated time window comes to an end without the operator terminating the operation? What if the drone operator does not end the flight (e.g. by mistake or negligence)? What can the USSP do? When?
response	Partially accepted The wording has been revised for clarity. A flight which continues past its authorised (planned) time is not conforming to the flight authorisation and hence should invoke a contingency plan. The U-space service provider can warn the UAS operator. A flight which has not ended is an active flight. An active flight subscribes to tactical services like Network ID (article 8) and the others in articles 9,10,11,12 and 13. Subscription to these services will require an active session on a computer (or smart device) and their provision will imply a cost to the USSP. The USSP may wish to design their contractual arrangements with the UAS operator so as to incentivise the correct termination of flights.
change to text	Yes

comment	GM2 Article 10(10) UAS flight authorisation service Does the flight end automatically with the landing or do the UAS operators have to give extra notice to the USSPs?
response	Partially accepted The wording has been revised slightly for clarity. Getting to the last location in the plan is usually indicative the flight has ended but not always, e.g. in case of a go-around or other landing issues. To generalise: 1) airborne flights with no associated plan or tactical services, e.g. network id or traffic info are a danger to others 2) the UAS operator is best placed to determine that the flight is over



change to text	Yes
comment	<p>GM2 Article 10(10) UAS flight authorisation service</p> <p>This seem to imply that the UAS Flight Authorization service will be used for traffic deconfliction. In order to efficiently support this, UAS Ground Stations should be interconnected with the USSP: information related to collision risk, present Flight Plan and updated Flight Plan can therefore presented to the UAS Operator in an optimized way. There does not seem to be any requirement for this. Furthermore, a technical interoperability standard is expected be necessary to support this interconnection.</p> <p>Also, to ensure efficient deconfliction and avoid that uncoordinated manoeuvres maintain a collision path, avoidance manoeuvres should be coordinated by the USSPs.</p>
response	<p>Noted</p> <p>The comment is correct. Much information from U-space is needed during flight and there is certainly a need for integration of the U-space originated data into the user-interface of any human pilot. Currently no standards are available for how to do this but when they are they should be considered. In the U-space airspace, the manoeuvres are the responsibilities of the UAS operators.</p>
change to text	No
comment	<p>GM2 Article 10(10) UAS flight authorisation service</p> <p>Ending an active flight is an action of the UAS operator and is not expected to be performed by the USSP automatically. We will need some sort of timer to automatically end flights that the operator forgot to end.</p>
response	<p>Partially accepted</p> <p>The wording has been revised slightly for clarity. A flight which continues past its authorised (planned) time is not conforming to the flight authorisation and hence should invoke a contingency plan. The U-space service provider can warn the UAS operator. A flight which has not ended is an active flight. An active flight subscribes to tactical services like Network ID (article 8) and the others in articles 9,10,11,12 and 13. Subscription to these services will require an active session on a computer (or smart device) and their provision will imply a cost to the USSP. The USSP may wish to design their contractual arrangements with the UAS operator so as to incentivise the correct termination of flights.</p>
change to text	Yes



comment	<p>GM2 Article 10(10) UAS flight authorisation service</p> <p>(c) is only of relevance for distributed CISP solution. (d) What happens when UAS operator does not terminate the operation ?</p>
response	<p>Noted</p> <p>The CISP is not involved in article 10. The CIS is described in article 5. The CISP provides the CIS. Article 10 is aimed at U-space Service Providers. Article 10(6) requires that USSP cooperate between themselves.</p> <p>The second is a question. The answer is that the USSP continues to provide services but the flight is considered to be non-conformant to the authorisation and should invoke a contingency plan. The USSP should warn the UAS operator.</p>
change to text	No
comment	<p>AMC1 Article 10(10) UAS flight authorisation service</p> <p>AMC1 Art10(10) UAS FIS (a): the USSP shall distribute updates, but there is no lead time defined. Be more specific, define lead time</p>
response	<p>Partially accepted</p> <p>The AMC/GM now asks that the information is delivered "as soon as is practical."</p>
change to text	Yes
comment	<p>AMC1 Article 10(10) UAS flight authorisation service</p> <p>A manned flight is not allowed to fly in controlled u-space airspace, unless DAR is applied.</p>
response	<p>Noted</p> <p>DAR is one option, however, DAR is only able to convert U-space airspace into controlled airspace. The AMC is in reference to 10(10) which should apply in any situation where ATC might be aware of "manned aircraft known or believed to be in a state of emergency, including being subjected to unlawful interference." Such a flight might be present in uncontrolled airspace and may not be able or willing to follow ATC clearances.</p>
change to text	No
comment	<p>AMC1 Article 10(10) UAS flight authorisation service</p>



	<p>It is said that USSP should “check for manned aircraft traffic that is conspicuous within its U-space airspace at a rate ...”</p> <p>This could be confusing as the conspicuity of manned aircraft is only required in U-space airspace established in uncontrolled airspace.</p> <p>We propose to write : “<i>check for manned aircraft traffic that is conspicuous within its U-space airspace, when established in uncontrolled airspace, at a rate...</i>”</p>
response	<p>Partially accepted</p> <p>The comment is relevant. The wording has been revised as a result of this and other comments</p>
change to text	Yes
comment	<p>AMC1 Article 10(10) UAS flight authorisation service</p> <p>AMC1 (b) “The USSP should (b) check for manned aircraft traffic that is conspicuous within its U-space airspace at a rate compatible with which surveillance data is received.”</p> <p>should be deleted as it is not a task of this service provider. There is no requirement for this in the Regulation; Article 10 (10) does not contain a corresponding provision.</p>
response	<p>Partially accepted</p> <p>The AMC aims to convert "continuously" into a period and a rate. The wording of b was about the rate and has been updated to better match the regulation.</p>
change to text	Yes
comment	<p>AMC1 Article 10(10) UAS flight authorisation service</p> <p>How is a USSP and/or UAS operator supposed to react to conflicting conspicuous manned aircraft traffic? Please clarify.</p>
response	<p>Partially accepted</p> <p>The USSP is supposed to react as mentioned in the regulation, to "update or withdraw authorisations as may be necessitated by the circumstances"</p> <p>The wording has been revised to clarify</p>
change to text	Yes
comment	<p>AMC1 Article 10(10) UAS flight authorisation service</p>



	The UAS flight authorization service must continuously monitor the input from the geo-awareness service, the TIS and the Conformance Monitoring in order to ensure that the operation can be safely executed. Which services are assigned which tasks ?
response	Noted The information is obtained from the other services an processed per the 10(10).
change to text	No

comment	AMC1 Article 10(11) UAS flight authorisation service Comment: AMC1 Art10(11) UAS FIS: to be as demanded fully harmonised also a standard and central repository for UANs is required, which must be operated centrally. Define standard and concept for a UAN standard and allocation system
response	Partially accepted. The GM has been revised for clarity. The reader is suggested to look at the GUF of FF-ICE from ICAO also the UUID commonly used in computing. One approach is to subdivide the range of identifiers and allocate blocks to different "issuers." The resulting identifier includes a part which indicates who the issuer is and another part which is unique for that issuer, or at least unique over a certain timescale. Version 5 UUID follow this pattern. The version 4 of UUID is simply a random number that is likely to be unique. The expectation is that the identifiers will eventually repeat but that by the time they do the thing they previously referred to will be of no interest. (See https://en.wikipedia.org/wiki/Universally_unique_identifier#Collisions for a discussion of this issue)
change to text	Yes

comment	AMC1 Article 10(11) UAS flight authorisation service This responsibility appears similar to a squawk. Do these numbers need to be recorded/logged? Therefore, does the operator need to add this number to its flight data or is it added/combined by the USSP?
response	Partially accepted The GM has been revised for clarity. The analogy is correct. The identifier is added to the flight authorisation during processing and communicated to te UAS operator when the approval message is sent.



change to text	Yes
comment	<p>AMC1 Article 10(11) UAS flight authorisation service</p> <p>Shouldn't this authorisation number issuing be standardised? At least at state level?</p> <p>Will there be an harmonised format for flight authorisation numbers in Europe?</p> <p>To be as demanded fully harmonised also a standard and central repository for UASs is required, which must be operated centrally. Define standard and concept for a UAN standard and allocation system</p>
response	<p>Partially accepted</p> <p>The expectation is that the standard is or resembles the UUID. See https://en.wikipedia.org/wiki/Universally_unique_identifier, also https://datatracker.ietf.org/doc/html/rfc4122</p> <p>The GM has been revised.</p>
change to text	Yes

comment	<p>AMC1 Article 10(11) UAS flight authorisation service</p> <p>AMC should specify how long the number has to be unique.</p>
response	<p>Noted</p> <p>The GM has been revised. Rationale: Recorded flight data will be used by accident-incident investigators, possibly by law enforcement and by the competent authority (or their agent) for studying the performance of the U-space, including detecting trends over time. In each case the probability of old data still being of interest decreases with time. For performance comparisons there will probably be an interest in looking back at least one year, perhaps a few. Hence uniqueness over two years would be valuable, over five years would be nice to have and over ten years is probably going to be sufficient for even rare cases. UUID version 4 offers 2^{121} values or about $2.7e36$. If they really are assigned at random, then the chances of two being the same are something like $2.7e18$ (see "the birthday problem"). If each citizen of Europe (~500 million) ordered 100 items per day delivered by drone, then we could expect two numbers the same every 89 thousand years or so. (back of an envelopes analysis). In case this seems inadequate, perhaps a 256 bit number could be used. Hence 10 years is the target.</p>



change to text	No
comment	<p>AMC1 Article 10(11) UAS flight authorisation service</p> <p><i>“over the full duration that the authorization is expected....including after flight”</i> It would be advisable to have a guidance over how long that “after flight” is expected.</p>
response	<p>Accepted</p> <p>The GM has been revised. Rationale: Recorded flight data will be used by accident-incident investigators, possibly by law enforcement and by the competent authority (or their agent) for studying the performance of the U-space, including detecting trends over time. In each case the probability of old data still being of interest decreases with time. For performance comparisons there will probably be an interest in looking back at least one year, perhaps a few. Hence uniqueness over two years would be valuable, over five years would be nice to have and over ten years is probably going to be sufficient for even rare cases. UUID version 4 offers 2^{121} values or about $2.7e36$. If they really are assigned at random, then the chances of two being the same are something like $2.7e18$ (see "the birthday problem"). If each citizen of Europe (~500 million) ordered 100 items per day delivered by drone, then we could expect two numbers the same every 89 thousand years or so. (back of an envelopes analysis). In case this seems inadequate, perhaps a 256 bit number could be used. Hence 10 years is the target.</p>
change to text	Yes
comment	<p>AMC1 Article 10(11) UAS flight authorisation service</p> <p>It is considered that a specific GM/AMC should be issued related to the codification associated to the three elements mentioned in Article 10(11) (authorised flight, the UAS operator and the U-space service provider issuing the UAS flight authorisation). It might help to uniform the issue and exchange of such information. A standard should be advisable.</p>
response	<p>Partially accepted</p> <p>The GM has been revised. It is agreed that standards would be useful. None has been identified, currently. For flight id, UUID would seem to be sufficient but industry may wish to propose something else.</p>
change to text	Yes



comment	AMC1 Article 10(11) UAS flight authorisation service Is this number needed ? Is it global unique number or only for a certain USSP ? Specify how (country, USSP-id, operator name, number) is part of number generation – should it be assigned by the central CISP ?
response	Noted The GM has been revised to clarify. Central issuance is not needed if a common approach is followed. The reader is suggested to look at the GUF1 of FF-ICE from ICAO also the UUID commonly used in computing. One approach is to subdivide the range of identifiers and allocate blocks to different "issuers." The resulting identifier includes a part which indicates who the issuer is and another part which is unique for that issuer, or at least unique over a certain timescale. Version 5 UUID follow this pattern. The version 4 of UUID is simply a random number that is likely to be unique. The expectation is that the identifiers will eventually repeat but that by the time they do the thing they previously referred to will be of no interest. (See https://en.wikipedia.org/wiki/Universally_unique_identifier#Collisions for a discussion of this issue)
change to text	No

comment	GM1 Article 10(10) UAS flight authorisation service There is no impediment this activity is performed by CISP when it exists
response	Not Accepted The regulation addresses the USSP in Article 10. The CISP responsibilities are in article 5. The AMC/GM cannot change the regulation. The Single CISP should not unduly take roles and responsibilities over USSP roles.
change to text	No

comment	GM1 Article 10(10) UAS flight authorisation service The term "currency" seems ambiguous and not well understood by non native English speakers. We suggest the use of "validity and availability" instead of "currency"
response	Accepted Wording suggestion is relevant. Changed as suggested.



change to text	Yes
comment	<p>GM1 Article 10 (11) UAS flight authorisation service</p> <p>In order to ensure "global uniqueness", there must be a global convention behind it that would ensure it. GM should provide more details about how this global uniqueness is ensured.</p>
response	Accepted. GM complemented.
change to text	Yes
comment	<p>GM1 Article 10 (11) UAS flight authorisation service</p> <p>The UUID is a software standard : the writing should be harmonized with paragraph (a) that mentions a "globally unique identifier". Proposal :Either keep "globally unique identifier", either keep "UUID" in both sentences.</p>
response	Accepted. GM revised as suggested
change to text	Yes
comment	<p>GM1 Article 10 (11) UAS flight authorisation service</p> <p>Consider adding a suggestion to record and store the data for future audits and monitoring perspectives.</p>
response	<p>Partially accepted</p> <p>The necessary statement is in AMC1 to 10(1). A linkage has been made between the two AMC/GM.</p>
change to text	Yes
comment	<p>GM1 Article 10 (11) UAS flight authorisation service</p> <p>Common secure interoperable open traffic information should be exchanged via the CISP in order to provide a reliable situational awareness picture to all users.</p>
response	Noted



	The CISP responsibilities are in article 5. The AMC/GM cannot change the regulation. The Single CISP should not unduly take roles and responsibilities over USSP roles.
change to text	No

Traffic information service

Comment	AMC1 Article 11(1) Traffic information service This leaves open how the operator is supposed to react to the traffic. Does he have any obligation to evade traffic? If so, is he allowed to violate the 95% rule, i.e. is conformance monitoring cancelled? Does he need to file for a new flight authorisation? For controlled airspace, we have the instrument of dynamic airspace reconfiguration. For uncontrolled airspace, it is not clear what duties the operator has to fulfil. Perhaps this is out of scope of this document, but a reference would be welcome. Even so, the consequences of evasive action to U-Space should be described in here.
Response	NOTED. The responsibilities of the UAS operators are laid down in Implementing Regulation (EU) 2019/947, UAS.OPEN.050, UAS.SPEC.050, and UAS.LUC.020. <ul style="list-style-type: none"> • The operator has the obligation to ensure separation and evade traffic. • The conformance monitoring is not cancelled. • The operator should not violate flight authorisation. • When practicable, the operator may revise the flight authorisation to avoid the traffic.
change to text	No

Comment	AMC1 Article 11(1) Traffic information service Received traffic information relevant for the UAS operator could be subject to acknowledgment.
Response	NOT ACCEPTED At this stage of the U-space regulatory framework, the USSP have limited responsibility and authority. Therefore, no acknowledgment is expected from the UAS operator is expected.
change to text	No

Comment	AMC1 Article 11(1) Traffic information service What is the meaning of 'reporting' of conflicting traffic? Is the depiction of a map on an app sufficient? The UAS operator should be actively notified with visual and aural alerts! Proposed change: add appropriate AMC ensuring effective transmission and interpretation of traffic information.
response	PARTIALLY ACCEPTED



	IR (EU) 2019/947 continues to apply. Once traffic information enters sphere of control of the UAS operator, guidance can be found in UAS.OPEN.050, UAS.SPEC.050, UAS.LUC.020. EASA agrees that the information needs to effectively convey.
change to text	Yes. AMC/GM to Article 7 are added to support this purpose.
comment	<p>AMC1 Article 11(1) Traffic information service GM1 Article 11 Traffic information service</p> <p>How is « proximity » is defined? Which distances (horizontal and vertical) are considered proximate? What is considered "without undue delay"?</p> <p>What is as the guidance to USSPs minimum well-clear distances to be kept between UAS and manned aircraft in U-space airspace in uncontrolled airspace?</p>
response	<p>ACCEPTED</p> <p>Appropriate values should be derived from the airspace risk assessment. Minimum well-clear distances in U-space airspace are not regulated. When manned aircraft operate in U-space airspace, they should expect to encounter unmanned aircraft. Nevertheless, minimum guiding values have been added as GM.</p>
change to text	Yes. GM completed.
comment	<p>AMC1 Article 11(1) Traffic information service</p> <p>From the context of this AMC, it is clear that the identification of the air traffic is done by the USSP and not by the drone itself. This means that an e-conspicuity receiver installed over the drone is not in line with what written here. It shall be specified that we are talking about Ground Infrastructure (electronic conspicuity receivers) which provides data to the USSP, which redistribute it to their drone operators.</p>
response	<p>ACCEPTED.</p> <p>The clarification is correct. Drone identifies to USSP by means of network identification service. USSP exchanges information with other USSP. Some other USSP notifies there UAS operators when necessary. USSPs need to acquire the e-conspicuity information, from another source or in deploying their own receivers.</p>
change to text	Yes. AMC/GM to article 11 and to article 7, where the obligation is, are added.
comment	<p>AMC1 Article 11(1) Traffic information service</p> <p>The term "known traffic" may be understood in various interpretations. What is the criteria for a traffic to be classified as "known"? Is it what is described in article 11-3? What would be done in case of detection of an unknown traffic?</p> <p>There are legal limitations on how traffic information can be shared outside the ATM system, i relation to secrecy, privacy etc...</p>
response	PARTIALLY ACCEPTED



	<p>As per the current framework detection of non-cooperative traffic is not possible. “known traffic” are those to be cooperative. In addition, traffic information regarding State and Military traffic which may not meant to be cooperative, may be provided by certain member states.</p> <p>Implementing Regulation (EU) 2021/665 Art. 1 amends Implementing Regulation (EU) 2017/373 as follows: [ATS.OR.127] Air traffic services providers shall [...] provide [...] the relevant traffic information regarding manned aircraft [...] as part of the common information services.</p> <p>Implementing Regulation (EU) 2021/664 Art. 5.2 states: Member States shall ensure that [...] relevant operational data [ATS.OR.127] [...] are made available as part of the common information services of each U-space airspace.</p> <p>Art. 5.5: Access to common information services shall be granted to relevant authorities, air traffic service providers, U-space service providers and UAS operators [...].</p>
change to text	Yes. AMC/GM are complemented or added to provide those clarifications how traffic information is elaborated.
comment	<p>GM1 Article 11 Traffic information service</p> <p>GM1 to Article 10 (2) (c) refers to separation (assurance). Like traffic information in manned aviation, traffic information service means that no tactical deconfliction (i.e. tactical separation) is provided, only strategic?</p> <p>In other words, will the USSP be required to give instructions to climb, hold, slow down or increase speed in order to deconflict? If so, what is this service called and when is it applicable?</p> <p>Like before, this could only happen in uncontrolled airspace. Is the USSP charged with tracking (via radartracks received via the CIS) and deconflicting drones from a manned flight as well?</p>
response	<p>NOT ACCEPTED</p> <p>USSP are not authorised to give instructions as climb, hold, etc. USSP are not charged with flight tracking, providing conflict resolution advisories, nor with separation of traffic.</p>
change to text	No
comment	<p>GM1 Article 11 Traffic information service</p> <p>The precision and accuracy of information may differ from one situation to another, however, even a partial data may add safety benefit.</p> <p>Suggested Solution: Delete "detailed and accurate".</p>
response	ACCEPTED.



change to text	Yes, GM1 Article 11 Bullet c is removed
comment	<p>GM1 Article 11 Traffic information service</p> <p>The problem regarding uncontrolled airspace is that the pilot of manned aircraft (CPA) can fly without being in contact with ATC, without any position reports or flightpath reporting – uncontrolled – and potentially not even indicated on radar. In particular, ATC separation services will most probably NOT be available for most of their flights. Other means of separation and traffic information should be used in the higher risk portions of trajectories to provide further mitigation.</p> <p>Whatever the detection system chosen, the following applies: Documented traffic information and traffic de-confliction scheme identifying tools / methods used for detection, assessment of effectiveness of such tools, adequacy of latency of remote pilot decision after detection of incoming traffic, criteria applied for the decision to avoid incoming traffic.</p> <p>It is suggested a mechanism for the:</p> <ul style="list-style-type: none"> - assessment of the human/machine interface factors that may affect the remote pilots' and USSPs' ability to make a timely and appropriate decision - assessment of failure rate and availability of the tool / methods used - demonstration that aircraft have adequate performance, such as airspeed, acceleration rates, climb/descend rates and turn rates, for effective avoidance - assessment that detection thresholds are set coherently with the scenario considering traffic that could reasonably be expected to operate in the area, traffic information update rate and latency, C2 Link latency, aircraft manoeuvrability and performance.
response	<p>NOT ACCEPTED. The problematics raised are true but are covered by other items of the regulatory framework.</p> <p>In U-space airspace, VFR flights have to share position reports with USSP [IR (EU) 2021/666 Art. 1, 2021/664 Appendix].</p> <p>Before designating an airspace as U-space, an airspace risk assessment is required acc. to IR (EU) 2021/664 Art. 3. Art. 3(4c) states that “member states shall determine applicable operational conditions and airspace constraints”. If the airspace risk assessment shows that there would be portions of operations in U-space airspace at higher risk, then member states are required to provide additional mitigation measures, or not have the airspace as U-space in the first place.</p> <p>Assessment of the human/machine interface factors that may affect the remote pilots' ability to make a timely and appropriate decision is regulated in IR (EU) 2019/947 Art. 8.</p> <p>Assessment of the human/machine interface factors that may affect the USSPs' ability to make a timely and appropriate decision is not applicable, as there is no human in the loop. The requirement for USSP is to deliver appropriate information in a timely manner, and protecting the integrity and confidentiality of the information where necessary.</p> <p>Assessment of failure rate and availability of the tool / methods used is addressed in IR (EU) 2021/664 Art. 7 and IR (EU) 2021/664 Annex III.</p> <p>Demonstration that aircraft have adequate performance, such as airspeed, acceleration rates, climb/descend rates and turn rates, for effective avoidance is regulated in DR (EU) 2019/945 and IR (EU) 2019/947.</p>



	Assessment that detection thresholds are set coherently with the scenario considering traffic that could reasonably be expected to operate in the area, traffic information update rate and latency, C2 Link latency, aircraft manoeuvrability and performance is also part of the airspace risk assessment (IR (EU) 2021/664 Art. 3).
change to text	No
comment	GM1 Article 11 Traffic information service The last line covers only e-conspicuity in uncontrolled U-space, whereas it seems to be needed also for some traffic in controlled airspace.
response	NOT ACCEPTED. Manned aircraft in U-space airspace being provided with ATC service, not need to make themselves e-conspicuous.
change to text	No
comment	GM1 Article 11 Traffic information service Common secure interoperable open traffic information should be exchanged via the CISP in order to provide a reliable situational awareness picture to all users.
response	NOT ACCEPTED. The exchange is intended between USSP.
change to text	No
comment	GM1 Article 11 Traffic information service About paragraph (b), the word "needs" (when, for whichever reason, a manned aircraft needs to cross...) should be removed. Justification: VFR and probably also IFR traffic in uncontrolled airspace are entirely free to enter a U-Space-Airspace provided that they make their position available to USSPs.
response	ACCEPTED.
change to text	Yes, text revised accordingly
comment	GM1 Article 11 Traffic information service It is suggested to delete paragraph (a). VFR traffic has no trajectory and even IFR (if the U Space is above a certain level) does not have to have a flight path either, so how is the traffic information being executed and on the other hand, with dynamic airspace reconfiguration, the U Space will be reduced?
response	NOT ACCEPTED. Implementing regulation (EU) 2021/666 Art. 1.2 amends Regulation (EU) No 923/2012 (SERA) as follows.



	<p>[SERA.6005] Manned aircraft operating in [...] U-space airspace, [outside controlled airspace], shall continuously make themselves electronically conspicuous to the U-space service providers.</p> <p>As regards dynamic airspace reconfiguration, air traffic control would decide the actual volume of U-space airspace to be deactivated - e.g. making use of pre-defined sub-volumes - taking into account any potential uncertainty of the manned traffic flight path. If such an uncertainty does not allow for any acceptable evaluation, a full deactivation would be the only option.</p>
change to text	No
comment	<p>GM1 Article 11 Traffic information service</p> <ul style="list-style-type: none"> - Which are the minimum contents of traffic information (e.g. absolute or relative altitude, bearing, GPS coordinates, make and model of a conflicting traffic)? - Is the UAS operator allowed to deviate from the flight authorisation in any dimension (horizontally and vertically)? - Is the UAS operator required to acknowledge the traffic information or inform the USSP about the avoidance manoeuvre?
response	<p>NOT ACCEPTED.</p> <p>The minimum content is indicated in IR (EU) 2021/664 Art. 11(3)(a) "The traffic information [...] shall include the position, time of report, speed, heading or direction, and emergency status of aircraft [...]."</p> <p>The operators are not allowed to deviate from flight authorisation. but they may file for a revised flight authorisation, see 2021/664 Art. 6(7): "Where UAS operators are not able to comply with the UAS flight authorisation deviation thresholds [...], they shall request a new UAS flight authorisation."</p> <p>The operators do not have to Inform USSP about avoidance manoeuvre.</p>
change to text	No
comment	<p>GM1 Article 11 Traffic information service</p> <p>In relation with paragraph (b) of GM1 Article 11, it is considered that a manned aircraft entering inside a U-Space airspace without the prior reconfiguration of the U-Space airspace (Article 4 of (EU) Regulation 2021/664) should be something absolutely unusual and exceptional. In such case, as occurs with manned aircrafts which suffers an emergency inside a non U-Space airspace, the manned aircraft should have priority, and the rest of traffics (in this case UAS traffic) should be separated from its proximity.</p> <p>It could also be convenient to introduce the text: 'The main objective of this service is to alert and support UAS operators to avoid a collision.'</p>
response	<p>PARTIALLY ACCEPTED</p> <p>The situation is not exceptional in uncontrolled airspace. For U-space airspaces established in certain airspace classes, manned flights can enter those U-space airspaces freely,</p>



	<p>provided they share their positions with the USSPs in those U-space airspaces (SERA.6005c).</p> <p>For U-space airspace established in other airspace classes, manned flights can enter those U-space airspaces after dynamic airspace reconfiguration.</p>
change to text	Yes, as per the proposed clarification.
comment	<p>GM1 Article 11 Traffic information service – Bullet c</p> <p>Clarification about how this possible need would be covered during the USSP certification process previous to any operation.</p>
response	<p>PARTIALLY ACCEPTED</p> <p>For certification purposes, USSP should declare the maximum latency they would be able to support with their systems in average cases. Furthermore, they would declare how to detect and mitigate bad or worst case scenarios. These declarations should be verified by the CAA; i.e. USSP provides proof to CAA, CAA certifies the operations at the declared level of performance.</p> <p>For a given U-space airspace, the member state determines performance requirements for USSP in that U-space airspace.</p> <p>If the required level of performance of a U-space airspace and the certified level or performance of a USSP do not agree, then that USSP cannot offer their services in that U-space.</p>
change to text	Yes, bullet c is removed from GM1 and clarifications with regard to certification are added to Art. 7 and Art 15.
comment	<p>GM1 Article 11 Traffic information service – Bullet c</p> <p>This should be part of the CISP-USSP contract – for safety reasons it is better to use same air situation picture (rather than XX different versions by the individual USSPs). Information from C-UAS systems may be integrated via a centralised tracking system (thus reducing the number of external connections for cybersecurity reasons).</p>
response	<p>NOT ACCEPTED</p> <p>The regulation introduced a joint responsibility for USSPs of a given U-space airspace to establish a shared/synchronised air situation picture.</p> <p>Counter-UAS systems is a valid concern. However, it is not in the scope of this regulation.</p>
change to text	No
comment	<p>GM1 Article 11 Traffic information service</p> <p>General: please note that the ASTM standard WK69690 “Surveillance SDSP for UTM” is currently in writing / ballot and covers many aspects provided here.</p>



	<p>General: it is not clear what is the source of this Traffic Information Service. Whether if it is simply the traffic information data coming from the CIS or if it is more (e.g., ADS-B IN ground receiver owned by the USSP – electronic conspicuity receivers). Also, it is not clear the relationship with the data coming from CIS and the data coming from the USSP. Shall these two be fused together?</p> <p>General: traffic information service should provide a map of their coverage if they have electronic conspicuity receivers. This coverage should cover at least the U-space airspace.</p> <p>General: it is also not clear if it is compulsory to have Traffic Information Service in a U-space airspace. Whether it is decided in a risk assessment phase</p>
response	<p>PARTIALLY ACCEPTED</p> <p>Reference to ASTM standard WK69690 is noted. The source of data to traffic information are: ATSP, Network ID/N-RID, SERA.6005c, and other sources for state and military traffic. AMC/GM are clarified. Coverage: IR (EU) 2021/666 Art. 15(1)(a) U-space service providers [...] shall be granted certificates if they demonstrate that they [...] are able to provide their services [...], [...] in compliance with the level of performance established by the Member States for the U-space airspace in accordance with Article 3(4) [Member States shall determine the U-space services performance requirements]. The service is mandatory service as per IR (EU) 2021/664 Art 3(2).</p>
change to text	<p>Yes. Source of traffic information is clarified in the AMC/GM to Art 11.</p>
comment	<p>AMC2 Article 11(1) Traffic information service</p> <p>It may not be the best solution to let the TIS be an individual USSP obligation. A centralized, tracking service is an overall safer solution (which also meet the needs of the authorities & ANSP of having a “single point of truth” air situation picture). The Network Identification Service places the obligation onto the USSPs to report positions of all drones and manned traffic to the TIS.</p> <p>Common secure interoperable open traffic information should be exchanged via the CISP in order to provide a reliable situational awareness picture to all users.</p>
response	<p>NOT ACCEPTED. As per the IR (EU) 2021/664 Art. 7(5)(a), the set-up if that for U-space airspaces multiple USSP establish a common situation picture. The USSP have to adhere to a common protocol.</p>
change to text	<p>No</p>
comment	<p>AMC2 Article 11(1) Traffic information service</p> <p>To define and set-up a common protocol for traffic information service is a good practice that should be extended at least to all mandatory services.</p>
response	<p>NOTED. The USSP have to adhere to a common protocol.</p>



change to text	No
comment	<p>AMC2 Article 11(1) Traffic information service</p> <p>The term open traffic information protocol may require clarification. Additionally, the use of common and interoperable protocols may be unclear as interoperable protocols may not necessarily be common. Suggested resolution: Modify the line to be more generic, such as "...adhere to a secure, interoperable, and open information protocol to ensure traffic information is..."</p>
response	ACCEPTED
change to text	Yes, changed as suggested
comment	<p>AMC2 Article 11(1) Traffic information service</p> <p>The traffic information should be provided exactly once. This means that the USSP should have "data fusion" capabilities. Is this an actual requirement? Should it be a distinction between data coming from the CIS (aviation certified traffic information) and the data coming from a simple e-conspicuity receiver?</p>
response	<p>NOT ACCEPTED</p> <p>Due to the real-time nature of traffic information, each USSP should minimise latency in handling of traffic information. The simplest and quickest way of doing this is to immediately forward information to everyone as soon as it is being received. The USSP have to control the information they forward to each other, to avoid degradation of services for themselves and for other USSP, and to avoid flooding of UAS operators with redundant traffic information. To mitigate, the USSP systems have to "remember" which information has gone which way, and discard or resend information as appropriate. This is usually handled at the network level. TCP has flow control; MQTT has quality of service allowing exactly-once delivery to subscribers etc. This has been expressed with the "exactly once".</p>
change to text	No
comment	<p>AMC2 Article 11(1) Traffic information service</p> <p>Does that mean that a subscription can be changed in the course of a flight? Consider further explanations.</p>
response	<p>PARTIALLY ACCEPTED.</p> <p>Acc. to IR (EU) 2021/664 Art.6, UAS operators are required to "ensure that during their operations, [...] U-space services [...] are used, [...]"</p> <p>It is not recommended to change the source/service in the course of a flight.</p>
change to text	Yes, clarification added to Art 6. "changed its subscription" removed



comment	<p>AMC1 Article 11(3)(a) Traffic information service</p> <p>What type of modifications are intended here? If a planned trajectory of a flight is shown (digitally, on a screen), which is derived from flat data, is that considered a modification?</p> <p>This requirement is ambiguous because the added value of a USSP is to provide adequate information to the UAS operators, potentially to filter only the useful information, in the form that would be the most efficient or adequate. So there may be a "modification" of the initial information to display it in the most efficient way.</p> <p>What does "without modification" mean? How does a USSP receive info about VFR traffic (unknown to ATS), is it possible to forward such info without modification?</p> <p>What if systems rely on calculation to extrapolate the position of an air traffic. I am specifically thinking about Multilateration. It is true that the information provided by the aircraft remains unaltered (for example, its altitude), but the position is completely calculated</p>
response	<p>PARTIALLY ACCEPTED</p> <p>The USSP does not "compute" or extrapolate traffic information. UAS provides their position to USSP by means of network remote id. Manned aircraft in U-space aircraft provide their position to USSP by means of electronic conspicuity or through the ATSP. Since the UAS operators are responsible for the safety of their operations, it is the responsibility of the other parties (ANSP, USSP) to forward the information as fast as possible, while protecting integrity and confidentiality of the information as necessary.</p> <p>The concern is related to the preservation of data integrity of the data source. The USSP should not alter the information received from other sources.</p>
change to text	<p>Yes, the item is transferred and clarified in AMC/GM to Art 7</p>
comment	<p>AMC1 Article 11(3)(a) Traffic information service</p> <p>Article 11.3.a requires the "time of report" which may be a piece of information that only the USSP may generate, e.g. if using the non-cooperative surveillance, thus modify the original input.</p> <p>The same article requires the "heading or direction" of the threat aircraft, which may be only or more accurately derived by the USSP surveillance system, than what would be contained in the data received from the aircraft (typically, an elementary Mode S transponder response would not contain any such elements).</p> <p>Suggested Solution: AMC should be reformulated to clarify the intention, bearing in mind the Remark, or deleted.</p>
response	<p>NOT ACCEPTED</p> <p>Acc. to the appendix of IR (EU) 2021/664, manned aircraft are only allowed in U-space airspace when sharing their positions with USSP. USSPs do not perform non-cooperative surveillance.</p>
change to text	<p>No</p>



comment	<p>AMC1 Article 11(3)(a) Traffic information service</p> <p>When referring to modification, would the filtering of applicable information for a particular operation based on geographic location or other factors be considered modification?</p> <p>Suggested resolution: Consider revision to use terms like "ensure information integrity"</p>
response	ACCEPTED
change to text	Yes, changed as suggested. Clarified in AMC/GM to Art 7
comment	<p>AMC1 Article 11(2) Traffic information service</p> <p>"USSPs should inform their UAS operators about the degradation of the traffic information services." This is true about all the other services as well, but not mentioned. Proposal : Extend this requirement to all the services and not traffic information services only.</p> <p>It is suggested to provide a more accurate criteria to ensure the information about the loss of the traffic information services to the UAS operators is properly taken into account and adequate contingency procedures are applied.</p> <p>USSPs should inform their UAS operators about the degradation of the traffic information services. The degradation terminology is not specific enough as the level of integrity and continuity of the traffic information services are not established.</p> <p>It is said that USSPs shall inform drone operators about the degradation of the traffic information service. USSP having notice a degradation of traffic information service shall also inform others USSPs operating in the same U-space airspace.</p> <p>USSPs should inform their UAS operators and ATS units about the degradation of the traffic information services."</p>
response	<p>ACCEPTED</p> <p>The recommendations are relevant, but do not apply to the sole Article 11. Those obligations are generic for the USSP and are transferred to the Article 7 and 6.</p>
change to text	Yes, AMC/GM are added to Art 6 and 7.
comment	<p>AMC1 Article 11(3)(a) Traffic information service</p> <p>Please note that the ASTM standard WK69690 "Surveillance SDSP for UTM" is currently in writing / ballot and covers many aspects provided here. Specifically, the Traffic Information Service should provide the coverage of its detection system in "real-time" (so including possible degradation), and an hearth bit providing the information if the system is on. The drone operator will promptly block its mission if no hearth bit is receiver or if a degradation of the system occurs and there is no more coverage in the U-space airspace.</p>
response	PARTIALLY ACCEPTED.



	<p>The point is noted and recommendation valid. UAS operators may have mitigation measures at their disposal, so cancelling missions outright might be too drastic, but this would be a contingency or emergency case. However those are more recommendations for UAS operators.</p>
change to text	<p>Yes, clarifications are added in new AMC/GM to Article 6.</p>
comment	<p>AMC1 Article 11(3)(a) Traffic information service</p> <p>What is meant by 'degradation of service' in the framework of traffic information?</p>
response	<p>NOT ACCEPTED. Traffic information is generated onboard aircraft, manned and unmanned; it is then received by a USSP system, from there forwarded to other USSP systems, and eventually to an UAS. The UAS operator, remote pilot, or software must then assess the air situation based on the accumulated traffic information, and take decisions appropriately.</p> <p>Traffic information is sensitive to delay. If the traffic information is out of date, the UAS operators may not be able to take appropriate decisions. To be useful to decision making, information about traffic must not be older than some upper bound.</p> <p>If a USSP cannot uphold the guarantee that traffic information forwarded to its UAS operators is never older than this upper bound, then the traffic information service is degraded.</p>
change to text	<p>No</p>
comment	<p>GM1 Article 11(3)(b) Traffic information service</p> <p>The overall assumption is that the periodicity frequency should be aligned with existing systems for ATM. The information should however be classified depending on aircraft type – e.g. about high speed military aircraft. 5-10 seconds is considered good enough at the moment of no historical data or experience.</p> <p>In the present draft version, this value has consequences for the latency of CIS and network identification. The update frequency and transmission speed of traffic information is of utmost importance. Consequently, a value needs to be provided and this has to be AMC.</p> <p>"Significant contribution" leaves ample room for interpretation. This cannot be assessed by the CA when issuing a certificate.</p> <p>Should the Member State set a value as part of the risk assessment?</p>
response	<p>ACCEPTED. The position information is generated onboard aircraft, manned and unmanned, and then send to USSP, maybe to other USSP (they have to exchange information), eventually to UAS operators. Update frequencies traffic information are pre-determined by requirements for aircraft to issue position reports.</p> <p>As guidance, traffic information should not be older than 5 s when used to make a decision. However the actual value would have to be determined by means of an airspace risk assessment.</p>



	<p>UAS operators are responsible for the safety of their flights. In order to be able to make decisions based on traffic information, and to take appropriate action, the traffic information should be most recent. Traffic information should be forwarded by USSP as quickly as possible to all relevant parties.</p> <p>USSP should declare (and be certified for) a latency they could sustainably support, and member states would determine a maximum latency, maybe maximum hop distance, as required level of performance for a given U-space airspace. If the required and certified latencies agree, the USSP can provide services in that U-space.</p> <p>It should be part of the airspace risk assessment, to determine a value for maximum latency, and, in consequence, for update frequencies.</p> <p>The comments are addressed within numerous areas (e.g. Art 3(4) or 11).</p>
change to text	Yes. AMC and GM to Art 3(4) added, AMC/GM to Art 11 reworked/completed.
comment	<p>GM1 Article 11(3)(b) Traffic information service</p> <p>No AMC/GM is provided for the Section (4) of Article 11. Why? What is the relevant action and which is the legal basis for it?</p>
response	<p>NOT ACCEPTED.</p> <p>The appropriate actions are being addressed by IR (EU) 2019/947 Annex parts A, B, and C, see UAS.OPEN.050, UAS.OPEN.060, UAS.SPEC.050, UAS.SPEC.060, and UAS.LUC.020.</p>
change to text	No
comment	<p>GM1 Article 11(3)(b) Traffic information service</p> <p>Considering that traffic separation will be ensured by USSP through the Flight Authorization service, the update frequency and latency of the Traffic information Service does not seem that critical.</p> <p>If Traffic Information Service is to be used as a back-up for flight plan de-confliction by UAS though, the requirement on the update frequency should be consistent with the separation requirements / objectives - which should be defined</p> <p>Then conservative (worst-case) UAS performance should be considered regarding UA manoeuvrability, acceleration and thrust - with consideration of adverse weather (i.e.wind), and lapse of time necessary for a remote pilot to identify a collision risk, define a collision avoidance path, request a Flight Authorization update and then implement the new trajectory request to the UA.</p>
response	<p>PARTIALLY ACCEPTED.</p> <p>The flight authorisation does not ensure separation with manned aircraft, but only with the 4D trajectory between UAS.</p> <p>The technical considerations are relevant are addressed in the risk assessment and definition of the performance requirement, and flight authorisation.</p>
change to text	Yes, clarifications have been made in AMC/GM to Art. 3(4).



Weather information service

comment **Comment 1:** the weather information should be provided by the CIS and by USSPs.
Comment 2: MET providers vs USSP providing weather information.
Comment 3: Weather information requirements for U-space seems light compared to MET requirements in Reg. 373.
Comment 4: the ICAO designator is not adapted to operations in the U-space and should be deleted from the AMC.

response **Comment 1:** NOTED. the Single CIS provider is not a U-space service provider and therefore is not intended to provide weather information service. The CIS is a platform/database where information and data is stored and can be exchanged but it is not, as such, a provider of U-space services. The reliable source of information is ensured by the CIS which provides the weather information to the USSP.
Comment 2: NOTED. Current MET providers may also provide weather information for U-space but if they do so it will be as USSP because only USSPs provide U-space services and they need to provide the 4 services. MET providers may provide MET information for drone operations if they are able to do so. It is expected that USSP are able to fill in the possible gaps (provide weather data for micro weather, low-level, around buildings....) to ensure weather for wider operational use.
Comment 3: NOTED. The AMC/GM related to weather information (as well as the regulation) cannot be as stringent than those under the ATM/ANS regulatory framework. The proposal is to identify which information need to be provided for drone operations. It is not the intent to copy/paste from Reg. 2017/373 but of course some common MET information for both U-space and ATM can be identified. Current MET providers do not have to comply with more requirements than USSP. They are either providing the current MET information to the CIS or if they want to provide specific weather data for U-space they will be under the same regulatory regime as USSP.
Comment 4: NOT ACCEPTED. The reference to the ICAO designator should be used but only when it is available, therefore it is recognised that it would not be always possible to use this reference for the location of the observation or the validity of the observation or forecast. Thus, the proposal to remove is not considered appropriate.

change to text **YES**

Conformance monitoring service

comment **Comment 1:** The UAS operator should be given an alert as well.
Comment 2: The confirmation of compliance is redundant and not in line with the implementing rule.
Comment 3: The failure to provide conformance monitoring service on the USSP side should not result in triggering the contingency scenario on the operator's side.
Comment 4: the sentence 'to match all incoming unmanned aircraft traffic information with their corresponding flight authorisation' suggests that all USSPs provide conformance monitoring for all UAS operations within the airspace, irrespective of whether these operators are their clients or not.

response **Comment 1:** ACCEPTED. Text is amended accordingly
Comment 2: ACCEPTED. The AMC proposing the confirmation of the compliance is removed. The conditions for non-conformance and triggering the alert are clarified.



Comment 3: NOT ACCEPTED. When the service is required to support safety of the operations, any degradation may represent a threat for safety. Therefore the UAS operators should react appropriately and potentially in performing the necessary contingency measures.

Comment 4: ACCEPTED. Text amended accordingly.

change to text

Yes

Certification scheme

comment

Comment 1: Applying the ATM/ANS rules is not proportionate nor pragmatic.

Comment 2: The ISO reference should be replaced by the more specific ISO reference applicable to U-space.

Comment 3: The reference to the ATM/ANS regulation is not clear to what regulation they should be linked to.

Comment 4: In AMC4 Article 15(1)(e), the term “highest performance standards” is not proportionate nor risk-based.

Comment 5: Time of keeping the records should be 30 days, not 5 years.

Comment 6: Business plan to mention that the provision of services to non-commercial operators, including model aircraft operators, clubs and associations is free of charge.

Comment 7: Retention period to be defined.

Comment 8: Avoid any overlap of conflicting or incompatible areas of responsibilities between ATM and U-space for obligations related to the emergency management plan.

Comment 9: Emergency management plan vs emergency response plan – consistency to be ensured.

Comment 10: The contingency plan should be applicable to the CISP.

Comment 11: General comments request clarification regarding the certification of the single CIS and the identification of the competent authority.

response

Comment 1: ACCEPTED. Although the proposed AMC and GM have been adapted to the specificities of USSP and CIS providers organisations, amendments have been introduced to ensure that the rules are not exceeding what is necessary in terms of costs and efficiency for both the industry and the competent authorities. The AMC/GM have been adapted where possible to ensure a pragmatic approach.

Comment 2: NOT ACCEPTED. The use of the ISO standard will require deep evaluation when the standard will be published.

Comment 3: NOTED. The reference in the sub-titles of the AMC and GM were included for easier reference of the reader to the applicable ATM/ANS rules. However, there are not necessary as such for the applicability of the provisions. The references are therefore removed from the subtitles.

Comment 4: ACCEPTED. Paragraph (a) is removed.

Comment 5: ACCEPTED. Text amended accordingly.

Comment 6: NO ACCEPTED. It is not the purpose of the AMC/GM to include a provision on the financing of the services for any operator.

Comment 7: NOTED. The retention period for operational data is 30 days as already included in Article 15(1)(g).



Comment 8: NOTED. The responsibilities between ATCO and USSP are clear according to the regulation and ATCO shall not be liable for incidents/accidents resulting from UAS operations. The U-space regulatory framework is applicable to unmanned aircraft only and ATCO remain responsible to manage manned traffic.

Comment 9: ACCEPTED. Emergency response plan is replaced with emergency management plan.

Comment 10: ACCEPTED. Reference to the CISP is added.

Comment 11: NOTED. The single CIS provider has to be certified because this is a new service provider introduced with the U-space regulatory framework. There is only one single CIS provider per U-space airspace. It is expected that this service will be provided mostly by current ANSPs who are certified against the ATM/ANS rules but will need to seek for a CIS provider certificate in accordance with Reg. 664. However, as the latter is mirroring the ATM/ANS certification rules, it is expected that such applicants are already familiar with the requirements that they are applying already. The identification of the competent authority is indeed embedded in the Basic Regulation but it is considered helpful to explain it in the guidance because many U-space stakeholders are not as familiar as ANSP/authorities in identifying who can be the competent authority. It is reminded that because of the novelty of the subject, EASA decided to include, to the most extensive way, any explanation possible to support stakeholders.

change to text

Yes

Competent authorities and coordination mechanism with local authorities

comment

GM1 Art.18 (f)

What is an U-space system ? The MS have to designate the CIS to operate system for this (semi-dynamic) U-space design information to CIS

response

Noted. The U-space system refers to the U-space airspace and all the actors supporting the provisions of services. The designated Single CIS provider is one of the actor with specific role and responsibilities and is not meant to play a role of coordination in the U-space system. The framework is similar to ATM, but in a tailored way.

change to text

No

comment

AMC1 Art 18(f)

Local authorities should be responsible for traffic control in the local area, just as they are responsible for ground traffic control. However, this responsibility of local authorities is not explicitly acknowledged as an Acceptable Means of Compliance (AMC). The process of approaching and engaging the various stakeholders/authorities should be carried out with a pre-defined methodology at national level in order to ensure trust and effective collaboration throughout the three phases of the U-Space deployment (i.e. planning, execution and review). The NPA lacks AMC to guide the Competent Authority in these tasks.

An Acceptable means of compliance (AMC) regarding a guaranteed influence for the local and regional authorities involvement in the coordination mechanisms work and the



	<p>planning and executing of the U-space airspace. The involvement of the local authorities like municipalities is crucial because they have a planning and zoning monopoly for land and sea. With a future of UAM and Urban air mobility ecosystem the infrastructure on land have to co-exist and integrate with the lower airspace and the very low altitude airborne traffic. To reach a future sustainable integrated system it is therefore crucial that local and regional authorities are involved in planning both land and air.</p> <p>On what criteria does the State base its designation of competent authorities? What is EASA's idea of competent authorities in this case? Does this include 'private stakeholders'? There are no other references to PRIVATE STAKEHOLDERS throughout the document.</p>
response	<p>Partially accepted.</p> <p>The importance of ensuring that local authorities (e.g. municipalities and regional authorities) and other entities are involved in the planning, execution and review of the U-space airspace is central to Article 18(f). AMC1 has been updated to highlight the importance of the involvement of local entities in the coordination process (e.g. text previously in GM1 became part of AMC1). However, AMC1 cannot be too prescriptive as it is then up to the Member States to tailor the details of the implementation of AMC1 to the national and local needs and practices.</p> <p>Text previously in GM2 has been used to introduce AMCs to highlight the importance of recognising and dealing with the U-space life cycle phases</p> <p>Private stakeholders are considered. AMC text and other text throughout was updated accordingly to provide clarification where needed.</p> <p>The purpose of this NPA is not to provide detailed, prescriptive requirements and guidance. The AMCs and GMs are used to set up the initial framework for the development and implementation of U-space airspaces throughout the Member States in the most harmonised manner whilst taking into account the need to tailor the U-space implementation to national/local needs and practices</p> <p>MS are fully responsible to identify and designate their competent authorities.</p>
change to text	Yes, GM raised to AMC, and complemented as indicated
comment	<p>GM1 Art.18(f)</p> <p>The importance of ensuring the impartiality of the U-space Coordinator as well as the need for its formal establishment (legally binding) is acknowledged in view of safeguarding both involvement of all relevant stakeholders and a harmonised implementation of the U-space Coordination Mechanism across Member States.</p> <p>The U-Space coordinator needs to be an independent, neutral entity that has been outfitted with the financial resources to perform its duties. A danger exists that not all stakeholder input is weighed equally if the U-Space coordinator is impartial. Municipalities and municipal participation structures that already exist in the Member States, have to be included. The competent authority cannot also be the u-space coordinator.</p>
response	Partially Accepted



change to text	<p>The importance of ensuring the impartiality of the U-space Coordinator as well as the need for its formal establishment (legally binding) is acknowledged in view of safeguarding both involvement of all relevant stakeholders and a harmonised implementation of the U-space Coordination Mechanism across Member States.</p> <p>The establishment of the role of U-space coordinator is ensured through the inclusion and modification of text from the previous GM1 within AMC1 (AMC2?). The GM are raised to AMC to strengthen the importance of recognizing and dealing with accordingly with the three different life cycle phases of the U-space airspace.</p> <p>Nevertheless, the coordinator could be part of the competent authority as per the rule. Independence can be ensured within the organisations, by clear role and responsibility.</p> <p>Yes, GM raised to AMC and complemented</p>
comment	<p>GM1 Art.18(f)</p> <p>The GMs related to this Article and AMC almost creates more confusion than guidance. AMC/GM is appropriate regarding these topics. While AMC/GM is "soft law", such guidelines might have a standardising effect. The GM are too prescriptive.</p> <p>Use "may" instead of "should"/"must" and avoid the use of present tense.</p>
response	<p>Not Accepted</p> <p>Deleting AMC-GM1 is not an option. AMC1 and GM1 were aimed to indicate the minimum requirements for ensuring implementation of the Coordination Mechanism required by Article 18(f) across the Member States to ensure a harmonised result. To this end, AMC1 has been further updated by taking into consideration the overall feedback from the public consultation.</p> <p>The AMC1/GM1 are not too prescriptive. They provide high level requirements and guidance so that each Member State can implement Article 18(f) by tailoring it to its local context (e.g. how public consultation processes are taking place).</p>
change to text	No
comment	<p>GM1 Art.18(f)</p> <p>It is important to guarantee influence for local and regional authorities in determining when different phases for planning different U-space areas should take place. The U-space coordinator needs to involve all the layers of governance, local and regional authorities before deciding where to start planning and executing a U-space airspace. The planning of U-space must go side by side in close cooperation with the planning of infrastructure on land. Planning for U-space in areas where the municipality has not yet finished its zoning in terms of infrastructure has little meaning and could result in a conflict of interests rather than opportunities.</p>



response	<p>The reference to model aircraft clubs and associations is limited to operations taking place in the context of model aircraft clubs and associations or on registered airfields and fails to recognise the broader scope of aeromodelling activities as explained above. The GM and AMC should explicitly recognise and take into account activities outside officially registered airfields. The GM and AMC should also explicitly take into account aeromodelling activities taking place under the open category, outside the framework of clubs and associations.</p> <p>Noted</p> <p>The role and responsibilities of the U-space Coordinator have been updated in the newly introduced AMCs.</p> <p>It is acknowledged the need to include current airspace users such as model ac/ clubs; however, these are not the only ones. As the AMC and GM cannot be exhaustive, the text in the AMC, and wherever else needed throughout the Art. 18(f) text, has been updated to highlight the importance of involving all relevant stakeholders in having the opportunity to express their views during the coordination process managed by the U-space Coordinator.</p>
change to text	No
comment	<p>GM1 Art.18(f)</p> <p>Has it been considered that perhaps some MS do not have the capacity to implement these coordination mechanisms (as they are designed in this GM)? Less than 1 year (2023) may not be enough time to change the MS' internal structures in order to carry out the tasks described here. Could this U-Space coordinator be a working group involving representatives of the parties to be consulted? Has it been considered that perhaps MS may not have enough time to implement such new and complex mechanisms? This requires the agreement of many different parties and involves highly complex consultation processes. Who will make the decisions in case of very divergent U-Space designation requests with conflicting interests? What are the conflict resolution mechanisms?</p> <p>It is futher unclear on which legal basis the U-Space coordinator can be designated and on which legal basis it will act.</p>
response	<p>Partially Accepted</p> <p>The importance of harmonisation across Member States in terms of both establishing multi-level governance and dealing with all life cycle phases of the U-space airspace has been acknowledged and has been reflected through the newly introduced AMCs.</p> <p>With regard to conflict resolution, the task of the U-space coordinator is to seek alignment as much as possible through the consultation of various stakeholders. The U-space coordinator is responsible for making a recommendation that the competent authority considers for its decision-making and arbitration as needed. Update version of Figure 1 as well Figures 2, 3 and 4 provide guidance for managing the coordination process throughout the U-space airspace life cycle phases.</p>



change to text	<p>The issues of the required timing, resources and skills are acknowledged but they are out of the scope of this NPA as they fall under Member States activities and initiatives. The acclaimed additional tasks and complexity brought forward by Article 18(f) aim to ensure that not only technological and operational maturity and readiness of U-space airspace are in place but also societal acceptance. It is of the essence of Art. 18(f) to plan and involve stakeholders thoroughly before implementation in view of nurturing the required levels of social acceptance.</p> <p>Yes, as indicated.</p>
comment	<p>GM2 Art.18(f)</p> <p>It is not clear what type of exceptional cases this paragraph refers to, please clarify, e.g. by providing examples. A definition of "near real time" in this context would also be welcome.</p> <p>Additional guidance or examples would be appreciated regarding KPI of U-space deployment as stated in GM2 Article 18 (f) - (b) (1).</p> <p>The introduction of the three phases seems more relevant for the management of a project than for dealing with airspace management. Airspace users are usually familiar with a different wording. It should be preferable to mention "Establishment phase" instead of "Planning Phase", "Operation" instead of "Execution phase" as it is a permanent one, and instead of "Review phase", it could be used "Review process". Indeed a U-space airspace is no more than an already existing portion of airspace where UAS fly and where it will be mandatory to use at least 4 services. It is not sure that the need of an observatory is automatic and helpful, neither KPI including targets which achievement has to be overseen. In addition, some paragraphs could be helpfully clarified.</p> <p>GM2 seems useless given explanations in GM3 and 4 and could be deleted.</p>
response	<p>Partially Accepted</p> <p>Deleting AMC-GM2 and requested text is not an option. Comments and requests provided are not aligned with the concept of multilevel governance and of participatory, responsible and sustainable urban mobility planning and deployment that are core principles of the European Commission's Urban Mobility Framework published in December 2021. This AMC/GM in fact complements and adjusts the existing aviation framework to support drones operations.</p> <p>The wording used to describe the life cycle phases of the U-space has been deliberately based on world class project and quality management terminology (thus avoiding aviation terminology) in order to ensure that it could be inclusively understood by the many different stakeholders, who originate from other sectors outside aviation, and who are going to be involved in the U-space airspace coordination mechanism.</p> <p>Providing detailed list of metrics and indicators is out of the scope of the current AMC/GM. Nevertheless, text was updated to give high level guidance on the need to include both aviation performance and safety metrics as well as sustainable urban mobility indicators.</p>



change to text	<p>Text has been updated to clarify that the 'near to real time' means the dynamic responses that are not referred to airspace communications/operations (as in Article 4) but to how we bring awareness of the ground/urban life incidents to the U-space airspace operations, so that the U-space can be modified accordingly if needed (based on Article 4).</p> <p>Yes, as mentioned</p>
comment response change to text	<p>GM2 Art.18(f)</p> <p>Task MS to designate the U-space observatory task and to operate the appropriate system. The text should be more specific and give clear order to MS to designate to operate system</p> <p>Be more specific and give clear order to MS to designate to operate system</p> <p>Not Accepted</p> <p>The rule refers to the competent authority. There is not possibility to allocate a task to the MS.</p> <p>No</p>
comment response	<p>GM2 Art.18(f)</p> <p>It should be possible to enter the review phase and to re-assess the designated U-Space Airspace also in case of new regular commercial UAM operation, which might be performed with a crewed VTOL. In that case, new routes should not be limited to only those airspaces where U-space is not established.</p> <p>The setup of a planning, execution and review phase is sensible and reasonable. Yet, financing aspects of the U-Space coordinator and the U-Space observatory is not adequately expressed. Furthermore, the review phase should include feedback by local stakeholders such as citizens, municipalities or municipal participation structures that already exist in the Member States, such as aircraft noise commissions in Germany, vendors or the needs of U-Space users.</p> <p>The setup of a planning, execution and review phase is sensible and reasonable. Yet, financing aspects of the U-Space coordinator and the U-Space observatory is not adequately expressed. Furthermore, the review phase should include feedback by local stakeholders such as citizens, vendors or the needs of U-Space users.</p> <p>The Plan-Execute-Review cycle is appreciated and will probably be an extensive process for the first years to come, but again, how will the coordination processed be financed? What if halfway through, the CAA decides that the proposed concept is not safe enough or in line with regulations? It is unlikely that U-space coordinators will manage the process without provision.</p> <p>Partially Accepted</p> <p>Text updated and it also contains with reference to an updated version of Figure 1 (for some technical reason an older version was included in the final draft NPA although the</p>



change to text	<p>current version was already available) that provides clarity on the interfaces (e.g. stakeholders involvement and feedback loops) of the Review phase.</p> <p>The issues of the required timing and financing although acknowledged, they are out of the scope of this NPA as they fall under Member States activities and initiatives.</p> <p>Yes, as indicated</p>
comment	<p>GM3 Art.18(f)</p> <p>The examples must be more specific. „Social" is an ambiguous term and should be further specified, e.g. by highlighting data and privacy issue, noise pollution, as well as local traffic concepts. U-Space must fit the local traffic infrastructure and complement it, without hindering other traffic users such as pedestrian, cyclists, public transport, etc. It further must not unnecessarily shift traffic from ground to air with further negative social impact. This needs to be addressed at the conceptual stage already.</p> <p>to (c): it should be noted that the „green light“ may also be given under certain conditions, e.g. during specified times of the day.</p> <p>The coordination process imposes that the CAA is not involved in the hearing stage. Consider revising and adding flexibility to MS to be able to improve and assess the coordination process at the initial phase in order to gain experience and spread knowledge across all stakeholders.</p> <p>The use of "should" in this GM is much too directive. The airspace management procedures and consultation process may greatly differ from one MS to another, and they will greatly depend on national practices and local laws.</p> <p>response</p> <p>Partially Accepted</p> <p>Text has been updated (including also an example). Text cannot provide complete and exhaustive explanations due to the nature of the topic. For this reason, it gives guidance on how to approach the challenge by opening space for all stakeholders to express their interests and concerns.</p> <p>With regard to the ‘hearing process’ it is not precise the comment that ‘the coordination process imposes that the CAA is not involved in the hearing stage’; the CAA (assuming it is the designated authority by the MS) is responsible for ensuring that there is coordination process but without being the one carrying out (updated text in AMC). To this end, CAA can be one of the stakeholders involved in the coordination process managed by the U-space coordinator (also designated by the MS).</p> <p>The wording is softened.</p>
change to text	<p>Yes, as indicated.</p> <p>comment</p> <p>GM4 Art.18(f)</p>



The hearing process is mentioned, but specifications regarding the Digital hearing Process are missing as well as deadlines, processes, and rules.

It is stated, that "the planning phase follows a screened trigger" to create a U-space. Consider to add a definition of criteria that trigger the planning phase for U-space designation.

This section should be part of an AMC. The process design is very good and should be more legally binding. Should this not be possible for the whole GM 4, it is suggested to at least include section (a) and (b) of the PLANNING PHASE in an AMC to ensure that public interests are considered adequately.

PLANNING PHASE

(4) While the U-Space coordinator should be entitled to make recommendations, the competent authority can at any time act against these. We are already experiencing today that the competent authorities decide against the recommendations of municipalities, municipal participation structures that already exist in the Member States, such as aircraft noise commissions in Germany or citizens (e.g. in consultations on low-noise flight routes for conventional aircraft) and we fear that this paragraph will open doors to the authorities could open to act against the interests of local communities. We therefore suggest giving more value to the U-Space Coordinators or making the recommendations of the U-Space coordinators more binding.

REVIEW PHASE

(a) the review process according to (a) can be initiated by municipalities, municipal participation structures that already exist in the Member States, such as aircraft noise commissions or citizens in Germany, and under certain conditions also by individual citizens, irrespective of incidents or accidents when other rights or interests are disturbed.

(2) privacy protection should be named explicitly.

(c) the U-Space coordinator should be entitled to make recommendations, the competent authority can at any time act against these. We are already experiencing today that the competent authorities decide against the recommendations of municipalities, municipal participation structures that already exist in the Member States, such as aircraft noise commissions or citizens (e.g. in consultations on low-noise flight routes for conventional aircraft) and we fear that this paragraph will open doors to the authorities could open to act against the interests of local communities. We therefore suggest giving more value to the U-Space Coordinators or making the recommendations of the U-Space coordinators more binding.

(2) More guidance should be provided on when a review can lead to small modifications or necessitates the restart of the whole coordination process. A more detailed list on possible new concerns that could result in a complete reinitiating of the planning phase may be helpful, e.g. significant change in noise exposure or findings on the annoyance effect, unforeseen implications on nature or public spaces or on other stakeholders.

response

Accepted

Text has been updated to provide the needed clarifications (e.g. the role and nomination of the U-space coordinator and its skills, explanations on multi-level governance setup, etc.). Please note that detailed prescription of the hearing process is out of the scope of this GM as it depends on the national, regional, and local laws, regulations and practices.

change to text

Yes, as indicated.



comment	<p>GM4 Art.18(f)</p> <p>Strike the role and tasks of U-space coordinator.</p>
response	<p>Not Accepted</p> <p>The requests to delete text related to the role and tasks of U-space coordinator (including the hearings and multi-level governance) are not accepted; gaining and maintaining social trust and acceptance throughout the different phases of U-space airspace deployment (planning, execution, review) is key enablers as it lies in the core of Article 18(f).</p>
change to text	<p>No</p>
comment	<p>GM4 Art.18(f)</p> <p>GM should clarify that the dynamic airspace reconfiguration by ATC should only be driven by the objectives of ATC, that is, by the ATC needs in managing the traffic. This is to say - ATC should be autonomous in making a decision for dynamically reconfiguring the airspace, and should not be prompted to do that due to non-aeronautical motives, however legitimate these motives be.</p> <p>By comparison, in the event of a security, sovereignty or environmental threat, any restrictions to airspace (e.g. partial or general ban on flying in certain airspace) is introduced by the responsible authority and notified, using aeronautical information management means, to airspace users and ATC units. Airspace is not protected by asking ATC to decline a clearance - operation within the airspace is banned, and ATC declines clearance as a consequence.</p> <p>All these coordination mechanisms, together with the implementation of the Airspace Risk Assessment and the coordination regarding security, privacy and environmental issues within this assessment can make the designation of U-Space airspaces very slow. Guidelines or ideas should be provided on how MS, especially those unable to increase their resources, could automate this U-Space observatory through computer software.</p> <p>The ANSP should be involved before the public consultation. If the designation of the U-Space airspace is not possible because of for example safety reasons the hearing of the public should be avoided, at least the hearing would be unnecessary.</p>
response	<p>Partially Accepted</p> <p>Text has been updated to provide the needed clarifications (e.g. the role and nomination of the U-space coordinator and its skills).</p> <p>Certain requests on naming specific stakeholders although recognised have not been explicitly listed in the text as this would create an exhaustive list that may vary according to national, regional and local characteristics.</p> <p>Certain requests on making the coordination mechanism more agile and less-resource-consuming are acknowledged but not accepted.</p> <ul style="list-style-type: none"> - This is because first, this GM provides only guidance in meeting the requirements of the associated AMCs. Gaining and maintaining social trust and acceptance



	<p>throughout the different phases of U-space airspace deployment (planning, execution, review) is non-negotiable as it lies in the core of Article 18(f).</p> <ul style="list-style-type: none"> - This GM recognises the need to develop new approaches, processes and skills to deal with a totally new approach in aviation in which non-aviation stakeholders need to be involved due to the nature of U-space airspace (e.g. social trust and acceptance). It is expected that the maturity of the process over the years will make it more agile and resource-optimised. <p>The request to delete reference to citizens was not accepted because the coordination mechanism in fact aims to involve the relevant stakeholders per regional and local environments. To this end, it is on the nominated U-space coordinator to decide who to invite to meet the regional/local needs. This may involve citizens (e.g. representative groups) or through existing civil associations.</p>
change to text	Yes, as indicated
comment	<p>GM5 Art.18(f)</p> <p>Strike the consideration of U-space KPIs' monitoring and feedback.</p>
response	<p>Not Accepted</p> <p>The request to delete text related to U-space KPI's monitoring and feedback from stakeholders is not accepted; gaining and maintaining social trust and acceptance throughout the different phases of U-space airspace deployment (planning, execution, review) is a key concept as it lies in the core of Article 18(f).</p>
change to text	No
comment	<p>GM5 Art.18(f)</p> <p>Does it mean "U-space designation" could be different in planning phase, execution phase, and review phase? It should be made clear that all stakeholders are using the same set of criteria to designate U-Space airspaces throughout the various phases, to ensure certainty for operators.</p> <p>Why is USSP only optional in the planning phase? It should be mandatory.</p> <p>In case there are several USSP coordinators a policy is needed which one has the final decision.</p> <p>Consider to add the CISP to (3) and USSP & ANSP to the table 1.</p> <p>As there is the provision in Regulation (EU) 2018/1139, Article 65 there is no need for AMC/GM.</p> <p>Please include 'establishment of new UAM routes' to the list of cases when the review phase is activated.</p>
response	<p>Accepted</p> <p>Text has been updated in as needed to provide the necessary clarifications on the topics pointed in the comments.</p>



change to text	No
comment	<p>GM5 Art.18(f)</p> <p>It would be necessary to better define the process to create cross-border U-space volume in case they are covered by the existing regulation.</p>
response	<p>Noted</p> <p>EASA recognises the need to improve the policy about cross-border, the guidance will be developed, relying on a concrete case during the implementation.</p>
change to text	No
comment	<p>GM5 Art.18(f)</p> <p>How and by whom are those actors authorized and on which legal basis?</p>
response	<p>Noted</p> <p>The legal basis for the actors/stakeholders to be involved are, in addition to the existing aviation laws, the ones applicable in each MS for carrying out public consultations for infrastructure projects of public interest. There is relevant text in other parts of the AMC/GM.</p>
change to text	No
comment	<p>GM5 Art.18(f)</p> <p>'Mandatory and optional U-space services should not be confused with commercial or publicly offered U-space services'</p> <p>Commercial or publicly offered U-Space service should be clearly defined in the NPA since they are not mentioned or defined in the U-Space regulation.</p> <p>It is recalled that as per Article 7, USSPs provide the mandatory U-Space services listed in Article 3(2) and the U-Space services mandated by Member States as per Article 3(3). Therefore, in addition to its definition, it should be clarified which entities provide 'commercial U-Space services' and 'publicly offered U-Space services'.</p>
response	<p>Not Accepted</p> <p>The purpose of the U-space regulations (664/2021) is not to determine the Commercial Services within U-space. The same applies to Article 18(f) that provides the coordination mechanism for the airspace designation, the establishment of airspace restrictions for UAS and the U-space services determination. .</p>



change to text

No

e-conspicuity

comment

Comment 1: The applications providing position information through mobile telephony devices are mentioned to be for “free”. That may limit business opportunities and market development.

Comment 2: Should manned aviation within U-space airspace not be, for safety reasons, subject to be also managed through a USSP when operating within ‘controlled airspace’?

Comment 3: Enforcing any USSP to support all specified means of transmissions by operators of manned aircraft, represents a significant burden and barer, as it may drastically increase the cost of the infrastructure.

Comment 4: Whole manned aviation needs to be electronic conspicuous in U-space airspace, not only manned aircraft.

Comment 5: How the risk assessment could consider the risk for safety that may represent the installation of technical solutions which were not primary intended to meet the manned aviation standards and safety requirements?

Comment 6: AMC1 SERA.6005(c) – What does prevent the adoption of UAT in the EU?

While, it is assumed that EASA should not enforce a technical mean not yet accepted by certain Member States. UAT has now been in use for several years, with ICAO recognised available standards, proven performances, proper coexistence with ADS-B 1090; while limiting the necessary modification of large number of existing installations.

The implementation of UAT in EU is strongly supported by numerous organisations and should be already enforced even within the limited opt-in member states, which could have accepted the technology.

Additionally, considering the technical benefits (no clogging), installation of non-certified UAT should be allowed.

Comment 7: Other existing and affordable alternatives to ADS-B 1090Mhz, may fulfil the technical need, and have to be explored by EASA, like:

- Low power ADS-B
- FANET & LoRAWAN platforms
- SSR transponder mode-S (without ADS-B), even relying on expanded ground installation.

Comment 8: While manned aviation provides full electronic conspicuity to U-SSP’s, the contrary is not established. This means that manned aviation, entering U-Space will be blind when drone position is considered. As no radio (voice) or data link from the U-SSPs towards manned aviation are mandated, this creates a situation in which safety of flight



is not increased. Furthermore, manned aviation flying in close proximity to U-Space will be vulnerable to a rogue drone, escaping the control of its pilot (line of sight or BLOS) and entering neighbouring airspace.

Comment 9: ADS-B out (1090 MHz) and SRD 860 frequency band are primary aircraft-to-aircraft communications means. Antennas on ground would have to be simultaneously deployed to receive the signals. It should be made clear that USSPs or Member States establishing U-space airspaces are responsible for the development of the ground infrastructure enabling the reception of the ADS-B and SRD 860 signals.

Comment 10: In line with the European Plan for Aviation Safety (EPAS 2022-2026) manned aircraft should not only be electronically conspicuous to the USSPs but also to other aircraft (manned and unmanned), Air-to-Air. Specific operations as Aerial Work should be also considered.

Comment 11: It is unclear what “standardised mobile telecommunication network services” and “coordinated for aerial use in Europe” are meant for.

Is it equivalent to Network ID? Which frequencies are referred to?

What kind of standard would be used, what would be its scope ?

In addition, any network that meets performance requirements and is approved by competent authority could be used, without necessarily being “coordinated for aerial use in Europe”.

Comment 12: AMC1 SERA.6005(c) – While the use of certified ADS-B out (1090 MHz) in the list of acceptable means is welcomed, installation of ADS-B out transmitter is currently not mandated for general aviation, or manned rotorcraft. Cost of an ADS-B out installation may be very high, especially if the aircraft is not pre-equipped with a GNSS source. Transitioning to that technology would represent burden on the whole general aviation or manned rotorcraft sector. It is unfair that whole general aviation or manned rotorcraft sector have to bear the costs and burden associated to the development of the Drones infrastructure, especially when considering that ultimately services will not be offered for free to all airspace users.

Comment 13: AMC1 SERA.6005(c) – The EASA proposal recommending use of ADS-B out devices transmitting on 1090 MHz brings the risk of saturating the system, affecting also commercial air traffic.

Moreover, ADS-B Mode S transponder comes with certain operational limitations, including limitations tied to operations at low altitudes, near structures and buildings, and similar line-of-sight limitations. These limitations in context of where U-Space would be deployed have to be considered.

Comment 14: AMC1 SERA.6005(c) - Lack of mature alternatives to ADS-B out 1090Mhz.

It appears that only ADS-B out 1090Mhz is technically fit to guarantee a sufficient availability and reliability to support e-conspicuity. The alternatives foreseen are based



on future evolution of the technology, which may not be available in a short-term future, and at the date of entry into force of the (EU) Regulation 2021/664 in January 2023; which will probably not allow the achievement of the intended objectives in the timeframe of the foreseen U-Space implementation.

Indeed, there are still many unsolved questions about the use of the SRD 860 frequency band and mobile telecommunication technology. Previous experiences (like VCS 8.33 or Mode S) and related delays and difficulties in implementation, the costs and complexity of getting equipped with the required e-conspicuity device bear the risk that a significant part of the low-level traffic (notably GA and military/State) will not be compliant in a near future.

In addition, the solutions based on mobile telephony, or SRD 860 MHz frequencies are incompatible with certified anti-collision systems used by aviation today, therefore, not directly contributing to an integrated increase of flight safety.

Therefore, implementing EU Regulation 2021/664 in January 2023 may ban aircraft without ADS-B from using U-space. Globally the feasibility of a rapid deployment of e-conspicuity and U-space implementation should be re-considered.

Comment 15: AMC1 SERA.6005(c) - Unreadiness and issue with the SRD 860 alternative

The SRD 860 band is extremely busy and does not guarantee the safe use of electronic equipment in this band required for “Safety of Life” application. There is no guarantee that the spectrum could support any performance requirements to deliver the required coverage, bandwidth, availability, continuity and reliability/integrity of transmissions.

Moreover, using 863–870 MHz for “Safety of Life” does NOT comply to international agreements stated by ITU Constitution in:

- ARTICLE 40 Priority of Telecommunications Concerning “Safety of Life”
- Annex 1003 Harmful Interference
- ITU RR No. 4.10 The protection of safety services from unwanted emissions
- ITU Radio Regulations - CHAPTER VIII Aeronautical services 43.1 § 1 Special rules relating to the use of frequencies

Similarly, this frequency band does not appear to comply with current regulatory framework to legally host the anticipated service with is assumed to have attached a certain safety level; unless either:

- IMT approves operation of such services by non IMT applications;
- Administrations grant exemptions on national basis.

Globally this frequency band is not fully available, in numerous EU Member States (.e.g under control of military authorities).

In addition, this frequency band is not protected, not reserved for aviation use; and may be susceptible to jamming and interferences (especially in busy environments). Such devices may also interference with existing avionics installed in manned aircraft.



Ultimately, as these systems are unlicensed, the manned aircraft operator may not have any legal protection e.g. in case of technical faults or radio interference issues leading to collisions.

Using SRD860 band and using a non-protected frequency for communications and e-conspicuity may not be appropriate w.r.t the level of safety required by the aircraft operation and the airspace environment.

Comment 16: AMC1 SERA.6005(c) - Lack of feasibility on GSM

Despite the EASA feasibility study and preliminary outcomes, even the fact that it is acknowledged that mobile telephony performs globally well for daily use of non-safety critical applications, there are still major uncertainties, related to the feasibility/practicability of the use of mobile telephony for e-conspicuity. The lack of maturity of the EASA's approach raises significant concerns to its suitability to support and "safety of life" applications, which may ultimately become threats for safety.

The soundness of the overall approach is challenged, as numerous general and technical aspects are unresolved or unaddressed:

- The mobile telephony coverage is not sufficient under all circumstances. The system will face several blind areas, such in remote or mountainous regions and/or narrow valleys).
- The continuity of transmission and thus of the service, will not be ensured, or on huge investments to complete the infrastructure in specific region and MNO.
- Mobile network ground infrastructure receives/transmits in a horizontal plane and is by design not suitable for airborne applications.
- There are country-specific restrictions for the aerial use of certain mobile telecommunication frequencies. As per the Multiple frequencies in use for mobile telecommunication suffer from "MOBILE except aeronautical mobile", exception currently only prevails for 65 / 2100 MHz.
- The frequencies used by aerial mobile telecommunication services should be consistent with the relevant decisions of the Electronic Communication Committee (ECC) of the European Conference of Postal and Telecommunications Administrations (CEPT) as implemented by national telecommunication authorities. The timeframe for establishing a ECC/CEPT decision allowing allocation of frequency for e-cospicuity, may not be commensurate with the U-space implementation.
- Compared to aviation specific systems, device performance and reliability cannot be ensured. The mobile network operators cannot guarantee proper the proper transmissions rates and latencies.
- GPS in a mobile phone is less accurate when it moves at speed and commonly needs aiding by ground stations. This is inherent to the low integrity of such GPS devices, unlike devices designed for aviation.
- Mobile network services cannot Safety relevant Quality of Service Characteristics that are usually attached to any function or equipment in aviation is not ensured.



- Embedding new emitting equipment, without ensuring proper control above applications, represent a risk of spurious transmission/emissions and interference with other systems and manned aircraft (especially with 5G where which would become “airborne jammers”).

Any service which only relies on mobile telecommunication network services would require clarification of coverage by all MNO’s acting in the country of consideration unless special MNO contract services become part of the regulation.

With regards to economical, latest statistics released by EASA show that the number of pilot licenses certified aviation, gliders, balloons, ultra-light, paragliders and motorized paragliders do not exceed 450,000 individuals. Therefore, it is difficult to believe that mobile network operators will consider e-conspicuity as a business case, and will contribute to its implementation. there is a lot uncertainties about the significant data rates and cost of such services, especially during longer flights.

In addition, mobile telephony service and application providers may be also very reluctant to provide services related to the aeronautical sector and such risk life applications, as they may not be not insured for such level of risk; and their liability could be invoked in the case of a fatal in-flight collision between a drone and a manned aircraft in U-Space.

EASA should step away from the thought of considering mobile phone applications for airborne conspicuity applications INCLUDING Air-to-Air Conspicuity, which are by definition “a safety of life application”. Indeed those uncertainties clearly demonstrate that the conditions under which a mobile phone system can be used are not realistic and therefore impracticable. There are too many unknowns and subjects that will need time to resolve to consider this solution as achievable in the time frame expressed by EASA and used to justify the rush to publish an NPA regarding U-Space, especially as no such radios based on a new standard are currently in existence.

Comment 17: AMC1 SERA.6005(c) – The mentioned “EASA technical specification” is not available or unclear.

Comment 18: Lack technical considerations in AMC1 SERA.6005(c) nor Appendix 1.

The Appendix 1 to AMC1 SERA.6005(c) miss to consider numerous technical aspects:

- Operating frequency.
- Expected performance of the reception of these transmissions, band capacity, bandwidth and update rate
- Transmission and radio access protocol, method / standard, acceptable error/corruption/loss rate
- Operational altitude where the emitter can be detected
- Power needs and limits

These omissions make the reception unimplementable, and jeopardise the implementation of e-conspicuity. The proper level of specification have to be standardised and made available.

Comment 19: Convergence of SRD 860 solutions



The SRD 860 band covers at least 3 different solutions: LoraWan (default 868.10, 868.30, 868.50), OGN/FLARM (868.2 – 868.4 MHz) and Pilotaware (869.525Mhz).

Are USSPs expected to support reception of all possible types? Will it be an obligation (in a transition period until ADB-L is available) to only support e.g. OGN/FLARM (& Pilotaware) in USSP ground receivers ?

It is also unclear whether this “ADS-L” can be used to convert already existing equipment/software installed in e.g. gliders to ONE common protocol:

- When can such “Standard” be ready?
- Is the intention to change the formats of FLARM/OGN & Pilotaware into some common format, yet to be defined?
- Which kind of transition period/process is foreseen for e.g. FLARM/OGN until all existing transmitters has been upgraded?

Moreover, technological and communication layer is owned by a private entity, it is questionable that EASA may recommend the use of a privately owned product to comply with a mandate, instead of public international aeronautical standard. What will be the incentive of vendors of products operating on the SRD 860 frequency band to enable their users to operate existing devices in compliance with the new EASA specifications. If vendors decide not to offer upgrades but only bring new devices to the market complying with the "ADS-L" standard, this will be an additional burden for manned aircraft users to acquire such devices and make themselves conspicuous using a recognised standard.

Comment 20: As the SRD 860 frequency band may be susceptible to interferences from other types of SRDs operating on the same frequency band and in the near vicinity, the operations in U-space may not guarantee a sufficient separation to this potential source of interference.

The communication section of GM4 Article 3(1) U-space airspace should explicitly address the need to assess whether or not the SRD 860 frequency band is appropriate to meet sufficient safety standards at the location of the U-space airspace (e.g. add a row dedicated to SRD 860 in the check list).

Comment 21: AMC1 SERA.6005(c) (2)(ii) Mobile telecommunication network services

The proposed means of compliance including to "ensure that all other applications or functions that might run in the background are switched off or made inactive".

Moreover, this provision can too easily be circumvented, for example by using two phone devices in the manned aircraft, one with the Electronic Conspicuity app and the second for typical personal, navigation and tracking apps which are widely used today. The result is that the letter of this rule is followed, as we now have two devices connected to the network. This increases the risk of gaps in the received data due to interference issues, which can lead to loss of the manned aircraft's position data at the USSP.



Very likely, it will be difficult for users to take and ensure control of applications and/or functions running on the background. This recommendation is hardly credible and applicable. It may likely result in a reduction of safety levels, and should be reconsidered.

Comment 22: Minimum position information listed in Appendix 1 should be “transmitted in a machine-readable format that is accessible to USSPs without any restriction.” While it is appreciated that the information is provided in a machine-readable format and without restriction, there is still scope for the data to be provided in many different formats, all of which must be accommodated by USSPs.

The cost to USSPs of supporting a large range of machine-readable formats for minimum position information could be prohibitive. It could restrict USSPs from being able to supply services in multiple markets because of different formats used, all of which need to be accommodated. The scope be restricted either by specifying the machine-readable format that should be used.

Comment 23: AMC1 SERA.6005(c) Requirements for communications, SSR transponder and electronic conspicuity in U-space airspace / Paragraph (a) (2)

In the note, it is stated that “the devices. should carry CE marking”. However, this indicative mat not provide enough evidence of its safety levels. The CE marking does not indicate that a product has been approved as safe by the EU or by another authority.

Comment 24: AMC1 SERA.6005(c) Requirements for communications, SSR transponder and electronic conspicuity in U-space airspace / Paragraph (a)

Point (2) addresses the standardized mobile telecommunication network services coordinated for aerial use in Europe. Satellite communications should be also considered, i.e.: currently ETSO-C159d provides an example for aeronautical mobile satellite (route) services (AMS(R)S) equipment authorisation that could be served to the purpose of this requirement.

Mobile satellite services should be added to the transmission systems listed in (a)(2).

Comment 25: AMC1 SERA.6005(c) Appendix 1 to AMC1 SERA 6005 nor GM1 SERA.6005(c) make clear who is obliged to receive these electronic conspicuity transmissions.

Comment 26: In CS-ACNS the “Note” of GM1 ACNS.D.ADSB.001 Applicability should be updated to reflect the needs induced by the implementation of Regulation (EU) 2021/666 amending Regulation (EU) No 923/2012 as requirements for manned aviation operating in U-space.

Comment 27: The CS-STAN Issue 3 Standard Change CS-SC005a allows for “Configuration 3: an ADS-B OUT system with a GNSS position source that is not approved.” The agency should clarify whether CS-SC005a Configuration 3 installations do meet the requirements for a 1090 MHz ADS-B Out system for purposes of operating in U-space.

Comment 28: The presence and/or position of Military and State aircraft should be provided by the CISP to the USSPs.



Moreover, who is responsible for authorizing military or state Aircraft flights ?
What are the role and responsibility of USSP in such situation ? Does it require tactical traffic management from the USSP?

Comment 29: For obvious safety reasons, manned aircraft should be ensure that he his properly electronic conspicuous prior to cross U-space airspace.
How can a manned Aircraft check, means to make themself electronic conspicuous are working properly not flying in controlled airspace before entering the u-Space (e.g. transponders, FLARM, mobile telecommunication,... equipment ? Would pilots be obliged to monitor their devices and react accordingly?)

Similarly, USSP could not be aware of a malfunction of their own systems, and might be required to install test transmitters that simulate manned aircraft transmitters at suitable distances from its receiver stations.

Ultimately, a solution could be to implement bi-directional communication links, which enable "loop back" testing of the radiolinks.

Comment 30: POSITION SOURCE. Based on ICAO provisions, IR 2017/373 ATS.TR.210 Operation of air traffic control service, and SERA.8005, geometric height information shall not be used to establish vertical separation. Using GNSS as a primary source for vertical separation and collision avoidance introduces a new risk potentially detrimental to the current safety levels. Additionally, under the item "POSITION", the table refers to "ALTITUDE" using a reference to WGS-84 and Height Above Ellipsoid (HAE). Altitude is defined by ICAO (and SERA) as "the vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL);" making the table not consistent with ICAO and SERA.

Comment 31: TABLES FOR OPTIONAL PARAMETERS. The indication that an aircraft is in distress may not be relevant for an USSP. What is the USSP supposed to do with the information?

Comment 32: TABLE PARAMETERS. Aircraft categories should be consistent with reg. 2019/945. In addition, modern ultralights have totally different flight parameters than paragliders or hang-gliders. "Ultralight" should be separated from paraglider and hang-glider.

Comment 33: TRANSMITTED PARAMETERS:

Transmitted data should have resolution requirements, for instance position coordinates. Similar data have resolution requirements in the aeronautical data catalogue contained in Regulation (EU) 2020/469.

In general, it is suggested that all transmitted parameters comply with equally or more stringent data quality requirements than those specified by the Aeronautical Data Catalogue, so that a "Total System Approach" is achieved.

Integrity (e.g. as materialised by "Navigation Integrity" and "Source Integrity Level") is usually a critical safety parameter. Please explain why has it been considered as optional. Is this consistent with integrity requirements in avionics standards for manned aviation?



Examples of acceptable standards to define HW and SW DALs, should be specified (in a GM).

Comment 34: TABLES FOR REQUIRED PARAMETERS / Address type

The ICAO 24-bits address may be reserved for ADS-B Out systems.

For SRD-860 or mobile phone based devices, how will the “unique identifier” be assigned to each user and how will the unicity be ensured?

Should it be unique within each specific U-Space (i.e. attributed by the USSP upon entering the U-Space) and updated by the manned aircraft as necessary?

Comment 35: TRANSMITTED PARAMETERS:

Why is “Time/Remarks” only applicable for SRD860 & Mobile ? ASTERIX CAT021/071-075 shows that manned aircraft should also insert a timestamp, if possible. We shall not keep old errors in the new solution.

Comment 36: TABLES FOR REQUIRED PARAMETERS

Can it be assumed that the Aircraft Category could be updated also to identify UAS (or different UAS categories) in a subsequent step?

While extending 1090 MHz to UA may not be suitable as the system seems to be already quite loaded, possibly SRD-860 could be extended to UA, thus enabling a collaborative detection mechanism between UAs.

Comment 37: GM1 SERA.6005(c) Requirements for communications... / NON-INSTALLED EQUIPMENT. It would be beneficial to clarify that the mentioned air operations requirements NCC.GEN.130 covers Personal Electronic Devices (PED) to ensure manned aircraft are continuously electronically conspicuous. Moreover, noting that “non-installed equipment” might be preferred option for multiple manned aircraft operators’ additional aspects are to be considered, to clarify how to handled non-installed equipment in:

- Minimum Equipment List (MEL)
- Aircraft maintenance instructions and documentation
- Weight and balance documentation (noting, that portable User Equipment only will give minimum contribution to weight and balance)

Why are there only references (CAT.GEN.MPA.140, NCC.GEN.130, NCO.GEN.125, SPO.GEN.130) to PEDs? Maybe it could be useful to add references to EFBs due to that is a device related to the aircraft operation and safety instead for the personal use by the flight crew (like PEDs). In the future, could it be possible to integrate them as an EFB application?

Comment 38: The use of mobile telecommunication networks requires further validation as there are some unresolved issues to be considered. Although the EASA feasibility study about the possibility of using mobile telecommunication technologies provides an initial assessment of these technologies, there are some aspects that would require further assessment before proposing a solution.



Comment 39: The use of CARS (Common Altitude Reference System) should be mentioned.

Comment 40: Installation of ground station infrastructure are too expensive. The UAT is not depending on ground stations to function. The ground stations are only required to rebroadcast data to participating aircraft. UAT works perfectly in an environment where rebroadcasting ground stations are not installed. The system functions as an air-to-air system and it is well known that the hardware necessary to receive UAT transmissions is affordable. Therefore U-SSPs could benefit from existing technology already recommended by ICAO (Volume III, Chapter 12), at the lowest cost to them.

Comment 41: ADS-L: Aviation already suffers from the abundance of different systems and standards. Developing ADS-I requires hardware manufacturers to modify their existing hardware and software. This means increased costs. This makes no sense as all these manufacturers already have developed products, available today using the full ADS-B standard. ADS-L is deemed necessary to be able to use the mobile telephony frequencies for a use that was never envisioned by the telecommunication providers.

Comment 42: Europe adopting a different set of standards than the rest of the world: If Europe adopts the concept of ADS-L, it is going to be isolated in the use of this system as all the other major regions of the world have already committed to the use of the ICAO recommended current standards (ADS-B 1090 and UAT).

Comment 43: The Tables for required parameters in Appendix 1 to AMC1 SERA.6005(c) (pg.109) should probably include more details, such as: the manned/unmanned status or number of POB. In that case, coordination should be established with ICAO RPASP WG6, which is currently drafting guidance into the Manual on RPAS Vol.II on the indication in the FPL.

Comment 44: To rely only on GNSS may be the most cost efficient solution for position source but relying on a single source may be prone to system vulnerability. A GNSS-infrastructure, may fail due to intentional or non-intentional loss of communication that may happen during the operations. Some sort of backup-plan needs to be accounted for.

Comment 45: The data listed in the table, this table can be challenged as not being proportionate, leading to undue increase of cost.

Comment 46: POSITION SOURCE. It is expected that the GNSS position source processes more than one constellation and/or uses SBAS augmentation if available. "SBAS" alone should not be presented as an equivalent alternative to multi-constellation GNSS.

Comment 47: Statement of Compliance. Does the "the manufacturer" mean the ADS-B OUT equipment manufacturer, the UAT equipment manufacturer or the "SRD 860" equipment manufacturer?

Comment 48: It is not clear how the U-space regulation has amended the list of reportable issues included in Regulation (EU) No 376/2014.



Comment 49: AMC 20-24 may be removed because is less restrictive than CS-ACNS and CS-STAN.

It could be useful to add some examples about aircraft applicability of CS-STAN, like “CS-STAN, Standard Change CS-SC005a INSTALLATION OF AN ADS-B OUT SYSTEM COMBINED WITH A TRANSPONDER SYSTEM” or Standard Change “CS-SC051c INSTALLATION OF ‘FLARM’ EQUIPMENT)” or “Standard Change CS-SC058a INSTALLATION OF TRAFFIC AWARENESS BEACON SYSTEM (TABS) EQUIPMENT”. It could be also useful to mention equipment (e.g. CAT.IDE, NCC.IDE, NCO.IDE, SPO.IDE), like radio and transponder to comply with SERA.6005 (a) and (b).

Comment 50: It is not clear, whether the pilots of manned aircraft using the standardised mobile telecommunication equipment would be obliged to monitor their devices and react accordingly. That may not be appropriate and could cause distraction to the pilots.

Comment 51: Please specify what is meant by "transmitted" and "accessible".

response

Comment 1: NOTED. The intent is to ensure consistent free access to position information as with the two other options proposed in the NPA. The USSPs’ access to the information without any restriction does not imply that the COTS equipment, application, services, etc, broadcasting the information are also meant to be ‘free’ (e.g. similarly to COTS equipment providing position information on the SRD 860 frequency band).

Comment 2: NOTED. At this stage of the U-space implementation, as indicated in the explanatory note, manned aircraft and UAS shall be segregated, meaning that U-space airspace is segregated from manned aviation, USSPs are not meant to manage deconfliction with manned traffic, and ATC units remain fully in charge of manned aviation and deconfliction in controlled areas.

Comment 3: NOTED. All proposed means were consulted with the affected USSPs that raised no major concerns. The final proposal needed to strike a balance as regards the following principles:

- From the perspective of manned aircraft — affordability (for end users), the technology is available now (for aviation and others), single device policy, simple installations, enable airborne collision risk mitigation for manned aircraft.
- From the perspective of USSPs — provision of minimum necessary position information (including that provided from third parties), affordable infrastructure (ideally compatible with the UAS needs), minimum performance meeting the U-space objectives.
- From the perspective of resources — existing international standards (aviation and others), pan-European applicability, ITU regulated spectrum, machine readable, open standards (non-proprietary or free of royalties).

Concerning ADS-B Out (1090 MHz) international standard — It is already required for a number of aircraft and is fully suitable for the U-space. Only complementary to existing



infrastructure mainly for low-level airspace will need to be installed on top of already existing systems (e.g. used by ANSPs, the military, etc.).

Concerning the SRD-860 frequency band — the ADS-L technical specification will provide for the technical standardisation of the spectrum. The infrastructure required is very affordable and expected to be used also by drone operators (e.g. for tracking), i.e. dual use for manned and unmanned aircraft. The processing of information transmitted via this spectrum is possible by using open and widely available industry standards (IT, telecommunications, security, etc).

Concerning mobile telephony — The use of this means is conditional and requires coordinated decisions by telecommunication regulators (CEPT/ECC), similar to the decisions concerning roaming services or standards. The processing of information via mobile telephony by USSPs will be required only once the relevant decision is published and applicable. It is expected that such decision will not require new infrastructure in general. The proposal relies solely on existing terrestrial networks of existing mobile network operators. The proposal will, however, require some adaptations of the existing mobile telephony systems to support the aerial use of devices based on the published coordinated decisions. The roll-out of the technology will be coordinated at European level to allow the USSPs' timely transition (i.e. connection of their system to servers used by providers of tracking applications for mobile phones to receive free of charge the position information from aircraft using the app).

Member States will be allowed in certain, very exceptional, and specific circumstances, and subject to the positive outcome of the airspace risk assessment, to relieve USSPs from the obligation to deploy the necessary ground infrastructure to collect all means of compliance to point SERA.6005(c). Further guidance about this aspect will be provided in the AMC and GM to Articles 3 and 11 of Regulation (EU) 2021/664.

Comment 4: NOTED. EASA confirms that the intent is to make manned aviation fully conspicuous, encompassing various types of aircraft — from lighter than air, hang-gliders, to rotorcraft, general aviation aircraft, etc.

Comment 5: NOTED. The use of non-aviation-specific technology does not mean that its use for this specific use case is unsafe. The actual performance of the technology (to be determined by USSPs before U-space implementation) in the given area/airspace will determine the necessary safety mitigation measures/margins (remain well clear) to be used by UAS operators to avoid collision hazards related to the operation of manned aircraft in the U-space.

Comment 6: NOT ACCEPTED. The UAT technology is included in the proposal because it is deemed technically suitable for use by manned aircraft in the U-space. Its deployment will be possible only after the associated spectrum is made available for this purpose in all Europe. This principle is necessary to ensure the safety of manned aircraft when flying in any U-space airspace. The use of various (selected) technologies in different U-space airspace volumes could otherwise lead to situations where manned aircraft could become invisible to UAS operators that operate in the same airspace where such technology is not supported. This is a particularly important consideration for unexpected cross-border flight deviations, e.g. due to weather.



Concerning the requirement for the use of certified devices, once the use of UAT technology in the U-space airspace will be possible. The spectrum used by UAT is licensed and thus requires approval by the relevant telecommunications authority that requires the device's ETSO authorisation by EASA. The use of non-ETSO devices in the U-space airspace in Europe would require Europe-wide consensus on deviation from the related ICAO standards or changes to the ICAO SARPs. Both options would require substantial coordination and technical effort and support from all Member States.

Comment 7: PARTIALLY ACCEPTED. Low-power ADS-B Out — The devices use licensed protected 1 090 MHz aviation spectrum, which is the only spectrum available in Europe for safety-critical applications (ATC separation, ACAS, etc.). The use of this spectrum requires approval by the relevant telecommunications authority, which may only issue it based on the device's ETSO authorisation by EASA. However, no international recognised standards exist for such devices; therefore, the issue of an ETSO authorisation is not possible. The acceptance of use of non-ETSO-authorized devices in the U-space airspace in Europe would require Europe-wide consensus on deviation from the related ICAO standards or changes to the ICAO SARPs. Both options would require substantial coordination and technical effort and support from all Member States. EASA and its partners (e.g. EUROCONTROL) will support development ICAO standards (and thus the possibility to issue ETSO authorisations) for these devices upon confirmation that:

- the safety of ACAS and ATC communications on that spectrum will be not be compromised on a Europe-wide scale (there are areas in Europe where the spectrum is highly saturated already now);
- the performance of the low-power devices using 1 090 MHz will be satisfactory to make aircraft electronically conspicuous in the U-space airspace.

FANET & LoRAWAN platforms — Such devices could be adapted by their manufacturers to comply with the ADS-L technical specification, which was developed with active support, among others, also from FANET community.

SSR transponder mode-S (without ADS-B), even relying on expanded ground installation — This technology requires active interrogations by surveillance systems. This is, however, technically not suitable/impossible in urban and low-level airspace due to the possibility of interference cause by obstacles and large objects. Additionally, such technology would need to be supported in any U-space airspace for safety reasons, which would require the installation of new infrastructure not affordable for USSPs.

Comment 8: NOT ACCEPTED. The system is framed to ensure separation (remain well clear) between UAS and manned aircraft, and is meant to be transparent from the perspective of manned aircraft. Drone operations within the U-space should be suspended in case of manned traffic. At this stage, raising awareness on manned aircraft is not deemed necessary. Furthermore, other safety barriers are intended to prevent 'rogue' drones from exiting the U-space, and should be required based on risk assessments (e.g. conformance monitoring, flight termination, etc.).

Comment 9: NOTED. USSPs are ultimately responsible for collecting position information from uncontrolled manned aircraft that operate in U-space airspace. USSPs are expected to utilise themselves existing infrastructure, or the infrastructure already used (e.g. by ANSPs, the military, States). The installation of new (but still affordable) infrastructure for



non-exclusive use by USSPs could be supported by external funds (e.g. Members States, regions, grants, etc.).

Comment 10: NOTED. The ADS-L technical specification will provide also for the necessary standardisation of position information transmission via the SRD-860 frequency band. This is expected to be a notable improvement as regards air-to-air detection, including when using the existing systems if adapted to ADS-L.

The uplink of aircraft position information transmitted via other means (mobile telephony or the 1 090 MHz frequency band) will be studied in the recently launched EASA research project about the interoperability of iConspicuity devices/systems.

Comment 11: NOTED. Mobile telecommunication network services refer to the cellular network, not to the network identification service. The technical details of mobile telecommunication network services for aerial use will be published in the relevant coordinated decisions of telecommunications regulators (e.g. CEPT).

Comment 12: NOTED. The proposal does not mandate the ADS-B Out technology for all aircraft. Aircraft operators may use any of the additionally proposed technologies (mobile telephony app or device using the SRD-860 frequency band and adapted to the ADS-L technical specification), whichever is deemed the most appropriate or affordable. The proposal is also expected to utilise existing devices adapted (in a short time) to the ADS-L specification. This will provide for additional iConspicuity functionalities. Thus, the additional cost and burden induced on the manned aircraft community to the U-space implementation is considered to be proportionate.

Comment 13: NOT ACCEPTED. The use of certified only ADS-B Out system compliant with international standards is not expected to deteriorate the saturation of the 1 090 MHz frequency (many users will select other means than 1 090 MHz). It may, however, contribute to ground infrastructure optimisation in the medium and long term, i.e. lower spectrum saturation.

The use of basic surveillance Mode-S transponders (without ADS-B Out) for electronic conspicuousness of uncontrolled manned aircraft in the U-space is not foreseen due to the necessity to interrogate the transponder and the risk of interference especially in urban and very-low-level airspace.

Comment 14: NOT ACCEPTED. The technology to support transmissions using the SRD-860 frequency band and mobile telephony is available today. Existing devices/systems using the SRD-860 frequency band will need a software adaptation to comply with the ADS-L technical specification. There is a sufficient amount of data collected to demonstrate the feasibility of the selected means of compliance. All relevant OEMs (also involved in the development of the ADS-L specification for the SRD-860 frequency band) confirmed their intention to update existing devices so that they conform to the ADS-L specification and could be used in a short time.

Comment 15: NOT ACCEPTED. The electronic conspicuousness of uncontrolled manned aircraft in the U-space is considered a safety-relevant function but not safety-of-life (or safety-critical) application.

UAS operators will be required to remain well clear of any manned aircraft and to comply with any necessary safety requirements corresponding to the performance of all



technologies used to support safe aircraft operations in the U-space airspace. The requirements will be developed based on the outcome of safety and risk assessments required before the implementation of the U-space.

There is sufficient evidence that existing devices/systems transmitting position of aircraft via the SRD-860 frequency band meet the necessary performance requirements for this use case. Additionally, the ADS-L technical specification will facilitate the optimisation and balanced use of the spectrums, redundancy and resilience (multiple frequencies).

The SRD-860 frequency band is coordinated regionally by the relevant telecommunications entities. The actual use of the SRD-860 frequencies referred to in the ADS-L technical specification will need to be confirmed by each national telecommunications regulator before the implementation in a given State.

The intended jamming and interference can harm any spectrum irrespective of whether protected or not. The SRD-860 frequency band is regulated in whole Europe and its appropriate use is enforceable by national telecommunications authorities, similarly to licensed and protected aviation spectrums.

Comment 16: NOT ACCEPTED. The electronic conspicuity in the U-space airspace is a traffic awareness function (remain well clear), and thus considered a safety-relevant function. This is different from safety-critical or safety-of-life functions like detect-and-avoid or ACAS. The feasibility study commissioned specifically to focus on this specific use case (electronic conspicuity of uncontrolled manned aircraft in the U-space airspace) confirmed the technical feasibility of mobile telephony technology under certain conditions that need to be specified by telecommunications regulators. Therefore, the possibility of utilising this technology for this specific function depends on meeting those conditions (including country specific) within the U-space airspace. The recently discussed draft decision of the CEPT/ECC PT1 confirms the validity of the study findings:

<https://www.cept.org/ecc/groups/ecc/ecc-pt1/client/meeting-documents/?flid=30416>

The other aspects like coverage, existing MNO infrastructure, continuity of service, and actual GNSS performance will need to be addressed in the implementation of each U-space airspace. This includes the demonstration of any necessary safety mitigation measures designed to ensure that UAS operators will be able to avoid any collision hazards based on the traffic information received from the USSP.

There is no additional liability for mobile network operators in this context. The function will rely on existing and public MNO services.

The use of smartphone applications for this purpose may be allowed only after demonstrating that its use meets all the necessary criteria including those specified by telecommunications regulators.

Comment 17: ACCEPTED. The '[EASA technical specification]' and the so-called ADS-L specification are still under preparation and will be made available to the public concurrently with the entry into force of the Regulation.

Comment 18: PARTIALLY ACCEPTED. The situation is acknowledged by EASA. The U-space implementation is a living and very dynamic process. EASA, in partnership with the industry through various initiatives (e.g. research projects, working groups, etc.), is continuously



working towards developing or adapting technical specifications to support the U-Space implementation.

The additional technical aspects supporting the implementation by OEMs and USSPs as specified in Appendix 1 will be published in the [EASA technical specification] referred to in the AMC1 to SERA.6005(c).

The remaining aspects would indeed be subject to airspace risk assessment (ref. Article 3(4) of Regulation (EU) 2021/664) before the implementation of the U-space airspace.

Comment 19: NOTED. Please see the answer to comment 22 below. The transmitted information in accordance with the ADS-L EASA technical specification accessible by USSPs and by any other entity without any proprietary limitations or royalties. The OEM of existing devices/systems indicated their intention and ability to adapt their devices to the ADS-L technical specification.

Comment 20: NOT ACCEPTED. The frequencies used by traffic awareness devices for transmitting are subject to regulatory requirements (e.g. duty cycle or transmission power) that are aimed at mitigating the risk of interference. All devices operating on those frequencies must comply with those requirements.

Additionally, the ADS-L EASA technical specification will provide additional means for the limitation of risk of interference (e.g. multi-frequency transmissions or design of a protocol resistant to information loss).

The actual performance of the SRD-860 frequency band used for electronic conspicuity will be subject to risk assessment required before the implementation of each U-space airspace (ref. Article 3(1) of Regulation (EU) 2021/664).

Comment 21: NOT ACCEPTED. The possibility of using mobile phone apps for compliance with point SERA.6005(c) depends on the type of services to be coordinated by the relevant telecommunications regulators (within the CEPT).

Major smartphone software platforms offer specific tools for the management of applications and user profiles. These tools allow users to set up a specific profile in a user-friendly way, which will disable (or switch off) all other applications running in the background.

Additionally, the applications used for the electronic conspicuity function could provide step-by-step instructions on how to eliminate transmissions from other applications or services. EASA will consider, in collaboration with the relevant application developers, the development of additional guidance to pilots to ensure the proper operation of recognised electronic conspicuity smartphone applications.

Comment 22: PARTIALLY ACCEPTED. The [EASA technical specification] will specify the format of the ADS-L message to be transmitted by manned aircraft in the U-space using the SRD-860 frequency band. This will make the receipt of position information by USSPs simpler and more affordable because USSPs will be required to receive and process information only if it is transmitted using the specified format.

The OEM will need to adapt their devices to transmit the ADS-L format in accordance with the [EASA technical specification].



Comment 23: PARTIALLY ACCEPTED. Although the CE marking does not directly demonstrate the safety of the product, it provides a certain assurance of quality and liability that the product meets the specifications and functions as declared by the OEM.

Comment 24: NOT ACCEPTED. The feasibility of satellite communication services for the electronic conspicuity function according to point SERA.6005(c) was not demonstrated. Such services could be added at a later stage once their feasibility for this purpose is confirmed.

Comment 25: ACCEPTED. The requirement in point SERA.6005(c) defines USSPs as recipients of the transmitted position information. The text of AMC1 to SERA.6005(c) will be amended to clearly reflect that obligation. Additionally, there is the corresponding requirement in Regulation (EU) 2021/664 for USSPs.

Comment 26: NOTED. EASA concurs with the request and has relayed the comment to the CS-ACNS owners.

Comment 27: ACCEPTED. The clarification is added that CS-SC005 Configuration 3 installations should meet the requirements for a 1 090 MHz ADS-B Out system for the purpose of operating in the U-space.

Comment 28: NOT ACCEPTED. In a decentralised model (without single CIS providers), the information goes to the USSP. The specific coordination arrangements between the relevant actors will need to be set up before the U-space airspace implementation in accordance with GM to SERA.6005(c). The arrangements should also contain a description of the roles and responsibilities for all relevant actors within the U-space airspace, including USSPs. The operation of civil aircraft (manned and unmanned) within the U-space airspace shall respect the right of State and military aircraft to operate within that airspace including if being non-conspicuous to USSPs.

Comment 29: NOTED. The operation of equipment according to the OEM instructions by aircraft operators should ensure conspicuousness of the aircraft to the USSPs. Any malfunction observed by the operator should be reported using conventional safety reporting mechanisms. The positive acknowledgement of receipt of information transmitted in-flight by the equipment is not deemed necessary for the intended function (similarly to the operation of conventional surveillance equipment when not subject to ATS).

Comment 30: PARTIALLY ACCEPTED. The field 'ALTITUDE' is a generic term in the specification and has a different purpose (name of parameter) than the term 'altitude' as defined by SERA. The term 'GNSS altitude' will be used instead.

Comment 31: NOTED. The processing and dissemination of information about manned aircraft emergency status (if known) to relevant parties (including relevant UAS operators) is a USSP obligation according to Article 10(10) of Regulation (EU) 2021/664.

Comment 32: ACCEPTED. Table updated; 'ultralights' are separated from paragliders and hang-gliders.

Comment 33: PARTIALLY ACCEPTED. The transmitted information in accordance with AMC1 to SERA.6005(c) does not fall within the scope of aeronautical data processed in accordance with Regulation (EU) 2020/469. All the requirements may be found in the 'ADS-L technical specification for SRD-860 frequency band'. The electronic conspicuousness of



manned aircraft in the U-space airspace is not considered a safety-critical function. Therefore, the integrity parameters are optional. Although DAL parameters are not required, clarification guidance on DAL as optional parameter will be added in the GM.

Comment 34: NOTED. The use of the ICAO 24-bit address is optional and can be used in case the aircraft has been assigned such address. The details of how the OEM should define unique addresses for devices transmitting via the SRD-860 frequency band will be provided in the [EASA technical specification]. The standards for mobile telephony network services contain provisions for ensuring the assignment of unique network addresses.

Comment 35: PARTIALLY ACCEPTED. The whole Appendix 1 to AMC1 SERA.6005(c) applies only to SRD-860 and mobile telephony options. The text in the 'Remark' field will be removed. It is not the intention of this AMC and GM to amend the requirement and standards for the ADS-B Out function. Such an initiative would be outside the scope of this rulemaking task.

Comment 36: NOTED. At this stage, e-conspicuity and N-RID are not planned to be merged. Should there be any convergence foreseen, the granular distinction of the type of UAS would indeed become necessary.

Comment 37: NOT ACCEPTED. The operational requirements are listed only as guidance for operators about the aspects that need to be considered for the electronic conspicuity function as non-installed equipment. The principles for its use are similar to those applicable to PEDs. The guidance is deemed sufficient for the initial implementation. The scope of point NCC.GEN.130 and of other referenced requirements remain unchanged.

Comment 38: PARTIALLY ACCEPTED. The EASA feasibility study confirmed the technical feasibility of the existing mobile telephony technology for the intended purpose. The suitability of local mobile telecommunication networks will need to be assessed on a case-by-case basis and completed by relevant MNOs and confirmed by telecommunications regulators before commencing operations in a particular U-space airspace. A transition period of 12 months will be allowed for USSPs and app developers to adapt their systems to comply with the coordinated decision of telecommunications regulators.

Comment 39: NOTED. The proposal anticipates the use of only GNSS-derived altitude (in relation to ellipsoid) for the electronic conspicuity function. The use of pressure altitude for this functionality is not foreseen due to a need for simpler and affordable solutions from the end user perspective.

Comment 40: NOTED. The proposed means of compliance provide for the most efficient use of investments already made while relying on an affordable technology when an investment in infrastructure is needed.

The scope of this proposal relates only to the transmission of position information of manned aircraft. The (re)broadcasting of that information is not part of this proposal. According to Regulation (EU) 2021/664, the position information needs to be collected by USSPs that will pass it on to UAS operators that will typically operate from the ground (i.e. ground receivers are necessary).

The UAT technology, as referred to in the relevant ICAO standards, is included in the proposal under the condition that it will be implemented and deployed at least for the electronic conspicuity function purpose in all Member States. This is necessary in order to



ensure flight safety and a seamless pan-European implementation of the U-space from the manned aircraft perspective.

Comment 41: NOTED. The ADS-L 4 SRD-860 technical specification for the electronic conspicuity function will require firmware updates similar to other regular updates these devices were already subjected to.

Comment 42: NOTED. There is no imminent need for a global standardisation of all the options proposed for compliance with point SERA.6005(c). The ADS-B Out and mobile telephony options will be based on globally acceptable standards (aviation related or others). ADS-L via SRD-860 may be eventually accepted even outside Europe.

Comment 43: NOTED. The specification contains a minimum number of parameters necessary for the electronic conspicuity function in the U-space airspace. Further parameters may be added later based on the specific use cases (e.g. air-to-air traffic awareness or ATM) and after appropriate coordination (including at ICAO level).

Comment 44: NOTED. Any necessary contingencies (e.g. tracking based on multilateration principle) will be implemented by the USSPs and the UAS operators. The initial U-space airspace implementation will typically be at very low levels and will require UAS operators to stay well clear of any manned aircraft.

Comment 45: NOTED. The table contains only a minimum set of parameters that are necessary for the intended function, and which need to be processed by the USSPs. Their views and comments were also considered in the development of this proposal. [EASA technical specification] for transmissions via the SRD-860 frequency band is being developed in close collaboration with all affected OEMs with the objective that the implementation of the specification by existing devices will be possible and affordable for their customers.

Comment 46: PARTIALLY ACCEPTED. It is recommended that the GNSS position source process more than one constellation and/or, if available, use SBAS augmentation. Clarification added.

Comment 47: ACCEPTED. The declaration of compliance is developed and added.

Comment 48: NOTED. The process of amending Regulation (EU) No 376/2014 is being run separately from the development of these AMC and GM. EASA will ensure any necessary coordination in this regard.

Comment 49: PARTIALLY ACCEPTED. AMC 20-24 is similar to the other items in the reference. A reference to CS-STAN is added.

Comment 50: NOTED. Pilots are not expected to continuously monitor the effective transition of their device.

Comment 51: ACCEPTED. The information (specified in Appendix 1 to this AMC) transmitted using a system referred to in points (2)(i) and (ii) should be transmitted in a machine-readable format accessible by the USSPs without any restrictions. The text is clarified.

change to text

Yes

