SEGMENT_DESCRIPTION	START_PAGE	COMMENT_NUMBER	commenter	comment	Diposition	Answer
(General Comments)	0	133	Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)	GeneralThank you for the opportunity to comment on Means of Compliance for mitigation means M2. Please be advised that	Noted	Thank you
(General Comments)	0	109	Farada Group	"drone designers"„It is the drones designers / equipment manufacturers duty, to implement test, and document a design" The problem is that "drone designers" do not create everything from scratch, we use ready-made GBS (Galaxy) parachute systems and adopt them to drones. Other manufacturers do the same (drones such as DJI + ready-made parachutes). The proposed regulations transfer to such operators the necessity of ordering expensive tests by so-called Integrators - independent entities that are able to carry out tests of the supplied drone + parachute system (because nothing else is proposed by EASA at the moment) which generates problems and costs. Is there a list of European entities of this type?	Noted	Parachute solutions are not the only one proposed. The UAS designer, or the mitigation means designer, can carry out integration activities. It is not clear which list the comments is requesting: there can be no EASA list of drone manufacturers, and new manafacturers appear continuously
(General Comments)	0	20	Eric WALTER	EXPLANATORY NOTE / 2nd bullet which reads "D2, which aims at providing guidance on how to assess the UA critical area for the selection of the correct UA size in SORA step#2."=> Does EASA confirm that D2 will be based on SORA 2.5 Annex F?	Noted	D2 will utilize crtitical area formula of Annex F and realistic / computed incidence angles
(General Comments)	0	21	Eric WALTER	DEFINITIONS / document Page 3"Integrator: in the context of this document, integrator is entity responsible for the integration of all the various parachute components, the sUA, and the testing of the entire system, as specified by ASTM F3322."=> the acronym sUA (small UA?) should be listed in the List of acronyms above	Accepted	
(General Comments)	0	19	Eric WALTER	Introduce page numbering in document footer	Accepted	
(General Comments)	0	108	Farada Group	The MoC raises serious concerns about the ability of manufacturers and operators to meet them, as well as the costs they entail.	Rejected	This comment is not substantiated and, in its form, could be proposed for any MoC/AMC/regulation
(General Comments)	0	76	Wing Aviation	The following improvements in the Definitions are proposed: - "Integrator: in the context of this document, integrator is entity responsible for the integration of all the various parachute components, the sUA, and the testing of the entire system, as specified by ASTM F3322-18." - "Critical Area: the sum of all areas on the ground where a person standing would be expected to be impacted by the UA system during or after a loss of control event, and thus the area where the baseline SORA assumes a fatality is expected to occur if a person was within it."	Accepted	
(General Comments)	0	75	Wing Aviation	The following improvements in the Explanatory Note are proposed: - Line 16: "Designers who have designed the UAS and/or the mitigation means and do not operate the UAS: if they apply to EASA for DV" - Lines 33 & 36: "The simple re-assessment of the critical area based on either the shape of the UA (e.g. multirotor which might be claimed to have a pure ballistic trajectory) or operational constraints (e.g. the remote pilot shall not accelerate the UA beyond a certain speed during the operation, but no technical means is provided to prevent such acceleration), or both, does not qualify for assessment under this document,. It will be treated by D2 in the frame of SORA step#2 and will not be addressed by DVR."	Accepted	
(General Comments)	0	74	Wing Aviation	The document refers several times to "90% reduction". However, it is not always clear "reduced from what". We have tried to fix this by adding some context along the document, although further assessment may be needed in case we have missed something.	Accepted	It is true that 90% was indicated without reference, and such reference has been addedd. However "with respect to what" is already clarified by chapter 1
(General Comments)	0	73	Wing Aviation	Wing would like to thank EASA and the members of the UAS TeB Airworthiness TF for putting together this M2 MoC. We believe it is very good and will certainly help the industry and regulators in Europe.	Thank you	
(General Comments)	0	152	Drone Alliance Europe	"Way ahead" section: Please explicitly mention that this M2 MoC can be used as a Means of Compliance for the M2 Medium Robustness mitigation in SORA, which is not clearly defined here.	Accepted	
(General Comments)	0	151	Drone Alliance Europe	The following improvements in the Definitions are proposed: - "Integrator: in the context of this document, integrator is entity responsible for the integration of all the various parachute components, the sUA, and the testing of the entire system, as specified by ASTM F3322-18." - "Critical Area: the sum of all areas on the ground where a person standing would be expected to be impacted by the UA system during or after a loss of control event, and thus the area where the baseline SORA assumes a fatality is expected to occur if a person was within it."	noted	see comment 76
(General Comments)	0	150	Drone Alliance Europe	The following improvements in the Explanatory Note are proposed:- Line 16: "Designers who have designed the UAS and/or the mitigation means and do not operate the UAS: if they apply to EASA for DV"- Lines 33 & 36: "The simple re-assessment of the critical area based on either the shape of the UA (e.g. multirotor which might be claimed to have a pure ballistic trajectory) or operational constraints (e.g. the remote pilot shall not accelerate the UA beyond a certain speed during the operation, but no technical means is provided to prevent such acceleration), or both, does not qualify for assessment under this document. It will be treated by D2 in the frame of SORA step#2 and will not be addressed by DVR."	Partially accepted	
(General Comments)	0	149	Drone Alliance Europe	The following improvements in the Explanatory Note are proposed:- "drone designers"„It is the drones designers / equipment manufacturers duty, to implement test, and document a design" The problem is that "drone designers" do not create everything from scratch, we use ready-made GBS (Galaxy) parachute systems and adopt them to drones. Other manufacturers do the same (drones such as DJI + ready-made parachutes). The proposed regulations transfer to such operators the necessity of ordering expensive tests by so-called Integrators - independent entities that are able to carry out tests of the supplied drone + parachute system (because nothing else is proposed by EASA at the moment) which generates problems and costs. Is there a list of European entities of this type?	noted	see comment 109

(General Comments)	0	148	Drone Alliance Europe	The text "Designers who have designed the UAS and/or the mitigation means and do not operate the UAS: they apply to EASA for DV" may be misleading. Does it mean that all designers shall apply to DVR of the mitigation means? It depends on the level of robustness, right? At the beginning of the same section, it says that this MOC applies for medium robustness mitigations which is out of the scope of DVR, which applies to high level of robustness. Additionally, alternative procedure to validate the approval from a particular NAA of the MS of EASA should be put in place, in equivalence with the DVR but applied by an operator/designer in NAA context.	noted	see comment 150
(General Comments)	0	147	Drone Alliance Europe	The document refers several times to "90% reduction". However, it is not always clear "reduced from what". We have tried to fix this by adding some context along the document, although further assessment may be needed in case we have missed something.	accepted	see comment 74
(General Comments)	0	146	Drone Alliance Europe	Drone Alliance Europe would like to thank EASA and the members of the UAS TeB Airworthiness TF for putting together this M2 MoC.We believe it is very good and will certainly help the industry and regulators in Europe. At the same time, the MoC may raise some concerns about the ability of manufacturers and operators to meet them, as well as the costs they entail	thank you	
(General Comments)	0	52	Schiebel LUC Organisation	Please assign number to tables and figures. Definitions. The loss of control events to which this document refers are those leading to a crash in the operational volume or ground buffer.	accepted	
(General Comments)	0	127	ISDEFE	The proposal is to remove: "in the operational volume or ground buffer".It is understood that the decision of the definition was due to the fact that those events leading to crash outside of the Operational area are already addressed in Step#9. Therefore, for Step 3, in order to calculate Final GRC, these possible events do not have to be taken into account to define the Ground Risk.Nevertheless, it is also understood that the Ground Risk should refer to the "risk of fatal injuries to third parties on the ground", in general. Due to SORA Step#9 requirements, the probability of failures or combinations thereof that may lead to a crash outside of the operational volume could have a lower frequency than those in the ground buffer, but it is considered that all possible "Loss of control events" and its causes should be taken into account for the purpose of this document.Additionally, 2.3.1. mentions "all probable malfunctions that may cause the crash of the UA". Just in case the above definition may lead to misunderstandings, the proposal is: Definitions. The loss of control events to which this document refers are those leading to a crash.	Rejected	It is not considered appropriate that the GRC (defined only for the operational volume and GRB) is affected by the consequences of a crash in the adjacent areas. (the mitigation means lower the risk of fatality after a loss of control event leading to a crash. This leads to lower GRC assigned and GRC is defined for Op volume and GRB only)
(General Comments)	0	126	ISDEFE	It is understood that D2 will include the guidance to calculate the "claimed critical area", CAc. SORA Guidelines (JARUS) Annex F with the mathematical model is also pending. Until then, is there any reference for CAc calculation to obtain risk reductions using Type 1 or Type 3 methods (related to M2 medium robustness)? Could it be clarified in the Explanatory Note?	noted	the available reference is the M2 MoC.
(General Comments)	0	6	DGAC FR (Mireille Chabroux)	DGAC France thanks EASA for the consultation of the means of compliance for mitigation means M2. DGAC France has no comment on the document.	Thank you	
(General Comments)	0	7	FOCA Switzerland	The Federal Office of Civil Aviation (FOCA) in Switerland thanks the EASA for having the opportunity to comment this Means of Compliance (MoC).	Thank you	
(General Comments)	0	1	Rigi Technologies SA	As asked during the workshop (22/02/2023):In Explanatory Notes, it is suggested that the MoC can be used by designers and operators with EASA or NAA. If one designer who is also an operator validates a medium level M2 mitigation with their NAA in the context of an OA (generic or particular), could other operators using that UAS in similar conditions (without violating the requirements from the mitigation) take profit of the OA received by the designer with their own NAA? As manufacturers, we provide technical data to our customers so they can apply for an OA. Therefore, the evidences for the medium level M2 parachute (which is integrated by default in our systems) would be available for them as well. I guess it would benefit everyone (manufacturer, operators and NAAs) if the process is as optimized a possible so the same evidence is not evaluated multiple times by different NAAs. The DVR would be an option to substantiate it. Therefore, we already have a solution. However, we were wondering if a signed document from our NAA would have the same validity.Could you please update the document to explicitly answer this and, if an alternative solution to the DVR is available, include that scenario in the document or refer to it.Thank you.	noted	The point is taken. It needs to be addressed in general, not only for this MoC
1. Nominal target for M2 mitigation with medium integrity	5	156	Drone Alliance Europe	The addition of a new bullet at the end of Type 1 providing guidance on the SORA ground model is proposed: "- The applicant may show that there are aspects of the critical area where a fatality is unlikely to occur; for example, the slide portion of the critical area for a lightweight thin UA that is most likely to impact a persone's feet or lower leg."	Rejected	For aircraft under 1 m this is already considered. Anyway, if you consider that the model needs to be corrected, the comment would need to be done for Annex F
1. Nominal target for M2 mitigation with medium integrity	5	23	Eric WALTER	Document PAGE 6 / end of section "For medium robustness mitigations it is acceptable to approximately reach the target safety gain."COMMENT:The intent behind this sentence is understood as "the above mentioned threshold are indicative; exceedance of those threshold is acceptable, up to some extent".This AMC could then provide some quantification of the extent level. Otherwise a potential risk is that this tolerance:* be variable, depending on the different individuals involved as stakeholders, and,* the tolerance gradually increases from project to project.So the AMC could introduce further guidance:"All the above values and equations are provided for nominal reference. For medium robustness mitigations it is acceptable to approximately reach the target safety gain i.e. exceedance up to 5% above the nominal reference should be acceptable."The 5% tolerance proposed here is just a proposal, without any other justification than the tolerance example mentioned in SORA 2.5 Annex F § 4.1.	Rejected	We prefer to not quantify the margin as for mediumk we should keep a certain qualitative view

1. Nominal target for M2 mitigation with medium integrity	5	157	Drone Alliance Europe	Following the general comment on the lack of reference for the reduction, the following improvement is proposed for Type 2: "In order to obtain a ground risk reduction (GRr) of approximately 90% by means of a reduction of lethality only from the SORA baseline assumption, or a lethality of approximately 10% or less, the following applies:"	noted	see comment 23
1. Nominal target for M2 mitigation with medium integrity	5	158	Drone Alliance Europe+D2	The addition of the percentage conversion of the lethality under Type 2 is proposed for clarity purposes: "If lethality ≤ 10% or 0.1, then 1 point of GRC can be claimed".	Accepted	
1. Nominal target for M2 mitigation with medium integrity	5	8	FOCA Switzerland	As regards the table on page 5, it is unclear what the leftmost value of 0.8 nominal critical area refers to, as it is not associated to any maximum characteristic dimension.	Noted	To a drone under 1 m one associates a CAn of 8 sqm. If one wants to apply a medium integrity mitigation M2 to such drone based on the critical area, then a reference "target" CA to aim to Is needed. This is 0.8. 90% is already mentioned by the current EASA AMC; this has been made now explicit. The nominal critical areas have been computed in Annex F and taken from the new Annex B, however in the consultation JARUS inserted wrong nominla critical areas in Annex B. JARUS has now clarified that the correct ones, in Annex F, are 8, 80, 800, 8000 for 1, 3, 8 and 20 m drones, and should have been reported in the Annex B of SORA 2.5. We have now aligned this document with the corrected nominal critical
1. Nominal target for M2 mitigation with medium integrity	5	117	LBA	LBA comment on the text "approximately 90%":Where is this value based upon? Wording is not in line with the SORA, ground risk class.LBA comment on the text "The following table2 shows the nominal critical area that should be considered associated to that column (CAn):"How to compute the nominal critical area? Annex F (JARUS) ? No basis given therefore the value are arbitrary.LBA comment on the text: "Max characteristic dimension (m) ≤1 ≤3 ≤8 ≤20 Nominal critical areas (m2) 0.8 8 135 1350 13500"Gap of the nominal area of <1 and <3 does not match the explanation of 90%reduction.LBA comment on the text: "In order to obtain a ground risk reduction (GRr) of approximately 90% by means of both methods (reduction of critical area and reduction of lethality), unless CAn = 135, the following applies"Wording and context unclear.Unclear for this special case. Better adapt the table von CAn	noted	
1. Nominal target for M2 mitigation with medium integrity	5	159	Drone Alliance Europe	If, as proposed, 8 m2 is replaced with 13 m2 in the first column of the table above, a correction factor is no longer needed: "If CAn = 135 (i.e.: UA dimension is between 1 and 3 m), a correction factor needs to be applied4: ● Lethality * [(0.9*CAc/127) + 0.043] ≤ 0.1	Noted	The correct new critical areas have now been communicted by JARUS (8, 80, 800, 8000) and included in this document. The calculation is simplified.
1. Nominal target for M2 mitigation with medium integrity	5	128	ISDEFE	"In order to obtain a ground risk reduction of aproximately 90%..."Could some additional clarifications be added? Is this a requirement: M2 medium robustness may be applied if the Ground Risk is reduced by 90%?.Proposal: "In order to apply the correction factors for M2 mitigations, a ground risk reduction of approximately 90% must be achieved. For that purpose, the following methods may be used:"Additionally, just for clarity, in the sentence: "to achieve a 90% reduction, the claimed critical area..." is proposed to be changed to:Proposal: "to achieve a 90% reduction of the ground risk, the claimed critical area..."	noted	text has been addedd to refer to the EASA AMC which already identifies the 90% as target
1. Nominal target for M2 mitigation with medium integrity	5	129	ISDEFE	Medium robustness. Could it be further clarified the intention of the sentence "aproximately reach the target"? For example in Type 1, the target is CAc/CAn<=0.1. What does it mean here "approximately"? It cannot be reffering to order of magnitude since there would be a substantial difference. The proposal is to remove the sentence: For medium robustness mitigations it is aceptable to approximately reach the target safety gain.	rejected	Medium integrity should not be purely quantitative, it has been decided to reflect qualitative elements with this terminology not necessary because it was possible to express type 1 in a different way
1. Nominal target for M2 mitigation with medium integrity	5	130	ISDEFE	The correction factor of Note 4 should also apply to Type 1	Rejected	
1. Nominal target for M2 mitigation with medium integrity	5	184	AIRBUS HELICOPTERS	With regard to page 5 - paragraph 1 - Nominal critical area table :COMMENT :What is the rationale for lowering the initial Critical area (compared to SORA v2.0 package) ? E.g: for an 8m characteristic UA, previous area was of 2000 m², now it is of 1350m².	Noted	And now it is 800 sqm; The rationale is Annex F
1. Nominal target for M2 mitigation with medium integrity	5	137	Board Member	It was not possible to add comments in the general comments section so we added this comment on the explanatory note in here: As a general comment, member states have sometimes already defined best practices for M2 medium robustness compliance and while harmonization is very welcomed the transition between the best practices of the member states for M2 and the applicability of the EASA M2 compliance can be difficult if the transition period is not clearly defined and grandfather rights are correctly delineated. We suggest that EASA or the task force provides some guidance for the member states for the implementation of the MoC. Some member state implement those changes very rapidly which is very impactful for some businesses. We propose for instance: Member states may define grandfather rights for appovals delivered before the publication of the MoC. The M2 compliance authorised before that date based on a best practice of a competent authority may remain valid for a period ...[defined by the Task Force].	noted	The point will be discussed at TEB level
1. Nominal target for M2 mitigation with medium integrity	5	136	Board Member	It was not possible to edit the general comments so we have added this general comment on section 1: The document doesn't have page numbers	Accepted	

1. Nominal target for M2 mitigation with medium integrity	5	135	Board Member	It was not possible to edit the general comments so we have added this general comment on section 1: As asked during the workshop (22/02/2023): In Explanatory Notes, it is suggested that the MoC can be used by designers and operators with EASA or NAA. If one designer who is also an operator validates a medium level M2 mitigation with their NAA in the context of an OA (generic or particular), could other operators using that UAS in similar conditions (without violating the requirements from the mitigation) take profit of the OA received by the designer with their own NAA? As manufacturers, we provide technical data to our customers so they can apply for an OA. Therefore, the evidences for the medium level M2 parachute (which is integrated by default in our systems) would be available for them as well. I guess it would benefit everyone (manufacturer, operators and NAAs) if the process is as optimized a possible so the same evidence is not evaluated multiple times by different NAAs. The DVR would be an option to substantiate it. Therefore, we already have a solution. However, we were wondering if a signed document from our NAA would have the same validity. The text "Designers who have designed the UAS and/or the mitigation means and do not operate the UAS: they apply to EASA for DV" in the explanatory note is misleading. Does it mean that all designers shall apply to DVR of the mitigation means? At the beginning of the same section, it says that this MOC applies for medium robustness mitigations which is out of the scope of DVR. Could you please update the document to explicitly answer this and, if an alternative solution to the DVR is available, include that scenario in the document or refer to it. Thank you.	noted	the topic of avoiding multiple evaluations by multiple NAAs is noted and will be addressed (however it cannot be tackled in the M2 MoC). Regarding the second question, it is possible to apply to an NAA for operational authorization. Therefore the applicant needs to be an operator, which does not imply it cannot be a drone designer (also). The app;icant needs to have the necessary technical evidence and, depending on the case, this might only be provided by the drone manufacturer to the operator. If the application is done to EASA (which is not mandatory for medium risk) the application needs to be for a
1. Nominal target for M2 mitigation with medium integrity	5	138	Board Member	It was not possible to add comments in the general comments section so we added this comment on the way ahead in here: Please explicitly mention that the M2 MoC can be used as a Means of Compliance for the M2 Medium Robustness mitigation which is not clearly defined here.	accepted	
1. Nominal target for M2 mitigation with medium integrity	5	49	Schiebel LUC Organisation	We propore the following: After consultation, carried out by EASA on behalf of the UAS TeB AW TF, it is planned to adopt the document: [...] Please revise the Footnote 3. "Consider" is repeated too much, making the sentence difficult to understand.	accepted	
1. Nominal target for M2 mitigation with medium integrity	5	83	Wing Aviation	If, as proposed, 8 m2 is replaced with 13 m2 in the first column of the table above, a correction factor is no longer needed: "If CAn = 135 (i.e.: UA dimension is between 1 and 3 m), a correction factor needs to be applied4: ● Lethality * [(0.9*CAc/127) + 0.043] ≤ 0.1	Rejected	JARUS has now communicated corrected nominal criticla areas for Annex B and this document has adopted them; the calculation is simplified.
1. Nominal target for M2 mitigation with medium integrity	5	77	Wing Aviation	The following improvement in the first paragraph is proposed: "M2 mitigations are intended to reduce the effect of ground impact once the control of the operation is lost. This is done either by reducing the size of the expected critical area (herein defined as “type 1” M2), or by reducing the probability of lethality of a UA impact leveraging e.g. energy, impulse, transfer energy dynamics, etc. (herein defined as “type 2” M2) or using both methods (“type 3” M2). The SORA conservatively assumes that all impacts are fatal (a fatality of 100%)."	Noted	This should be clear from the SORA
1. Nominal target for M2 mitigation with medium integrity	5	78	Wing Aviation	In the table provided under Type 1, it is not cleat to which max. characteristic dimension the value of 0.8 nominal critical area corresponds to, as dimensions below 1 m are already covered under the following column on the right. It is, therefore, suggested removing this column. This should also be reflected in the table used in Example #3.	Rejected	It is not necessary to associate a dimension, the 0.8 is there only to provide a reference for critical area reduction target so that it is still possible to apply M2 baed on critical area reduction also to drones which are classified in the first column
1. Nominal target for M2 mitigation with medium integrity	5	79	Wing Aviation	In the table provided under Type 1, the 8 m2 value comes from a random example. For this reason, the max. acceptable value of the nominal critical area under the column of a max. characteristic dimension lower than or equal to 1 m should be aligned with the rest of the values of the table, where the difference is an order of magnitude. In other words, 8 m2 should be replaced with 13.5 m2. This should also be reflected in the table used in Example #3.	Rejected	The document is aligned Annex B of SORA 2.5; crticial areas in Annex B of SORA 2.5 where not aligned with Annex F. JARUS has communicated this mistake. We have now aligned the document with the correct critical areas.
1. Nominal target for M2 mitigation with medium integrity	5	80	Wing Aviation	The addition of a new bullet at the end of Type 1 providing guidance on the SORA ground model is proposed: "- The applicant may show that there are aspects of the critical area where a fatality is unlikely to occur; for example, the slide portion of the critical area for a lightweight thin UA that is most likely to impact a persone's feet or lower leg."	Rejected	see comment 156
1. Nominal target for M2 mitigation with medium integrity	5	81	Wing Aviation	Following the general comment on the lack of reference for the reduction, the following improvement is proposed for Type 2: "In order to obtain a ground risk reduction (GRr) of approximately 90% by means of a reduction of lethality only from the SORA baseline assumption, or a lethality of approximately 10% or less, the following applies:"	Rejected	This sentence does not seem so clear
1. Nominal target for M2 mitigation with medium integrity	5	82	Wing Aviation	The addition of the percentage conversion of the lethality under Type 2 is proposed for clarity purposes: "If lethality ≤ 10% or 0.1, then 1 point of GRC can be claimed".	Accepted	
1. Nominal target for M2 mitigation with medium integrity	5	153	Drone Alliance Europe	The following improvement in the first paragraph is proposed: "M2 mitigations are intended to reduce the effect of ground impact once the control of the operation is lost. This is done either by reducing the size of the expected critical area (herein defined as “type 1” M2), or by reducing the probability of lethality of a UA impact leveraging e.g. energy, impulse, transfer energy dynamics, etc. (herein defined as “type 2” M2) or using both methods (“type 3” M2). The SORA conservatively assumes that all impacts are fatal (a fatality of 100%)."	Accepted	see comment 77

1. Nominal target for M2 mitigation with medium integrity	5	154	Drone Alliance Europe	In the table provided under Type 1, it is not cleat to which max. characteristic dimension the value of 0.8 nominal critical area corresponds to, as dimensions below 1 m are already covered under the following column on the right. It is, therefore, suggested removing this column. This should also be reflected in the table used in Example #3.	Rejected	see comment 78
1. Nominal target for M2 mitigation with medium integrity	5	155	Drone Alliance Europe	In the table provided under Type 1, the 8 m2 value comes from a random example. For this reason, the max. acceptable value of the nominal critical area under the column of a max. characteristic dimension lower than or equal to 1 m should be aligned with the rest of the values of the table, where the difference is an order of magnitude. In other words, 8 m2 should be replaced with 13.5 m2. This should also be reflected in the table used in Example #3.	Rejected	see comment 79
1. Nominal target for M2 mitigation with medium integrity	5	22	Eric WALTER	PAGE 5 / on Text "The following table shows the nominal critical area that should be considered associated to that column (CAn):"COMMENT: Reference to the supporting material behind the critical area table could be recalled (i.e. SORA 2.5 Annex B or Annex F - although in the current public draft of Annex F, Appendix A.6.3 Table 19 presents different, lower values).In any case, the comment is about putting a reference to the validated document presenting justifications for the figures in the table.	Noted	The way the M2 MoC considers and utilizes SORA 2.5 is already clarified by the document
1. Nominal target for M2 mitigation with medium integrity	5	185	AIRBUS HELICOPTERS	With regard to page 5 - paragraph 1 - Claimed critical area (CAc):COMMENT :Could EASA confirm that the lethal area should be considered within the claimed critical area?	Rejected	The definition of Annex F seems sufficiently clear: Critical Area: the sum of all areas on the ground where a person standing would be expected to be impacted by the UA system during or after a loss of control event, and thus the area where a fatality is expected to occur if a person were within it.
2. General Means of Compliance for M2 medium robustness	6	25	Eric WALTER	GENERAL Comment:The effect of the mitigation mean on the operational volume and ground risk buffer should be investigated somewhere.For example with the introduction of a PRS, it can be expected that owing to wind, the descent trajectory will include a more important horizontal component i.e. under parachute, the UA will drift and may land outside the Operational Volume and Ground Buffer.In SORA the baseline definition for the ground buffer is 1:1 and it is only covered in Step#2 and Step #8 (Containment).In Step #2, SORA instructs to define a ground buffer "appropriate for the operation", with the default baseline being 1:1.However mitigation means M2 are only introduced in Step #3.In Step #8 "Containment", the size of the ground buffer is potentially reviewed - in particular to take into account meteorological conditions - but only for Medium and High Containment i.e. when the GRC is higher by 4 order of magnitude than the Contingency volume.When there is No or Low Containment requirement, there is no requirement to revise the GRB - yet when the SAIL is reduced by M2, the suitability of the default ground buffer should be reviewed.	Rejected	If an operation only requires Low Containment, it is already factored in, that at least 10% of crashes/forced landings will happen even outside the ground risk buffer. For that reason, a more accurate buffer including e.g. delays and wind drift to also cover worst case situations is not required. However, if you use a PRS and require more containment, the size of the GRC buffer is directly affected by the mitigation and your mentioned considerations need to be taken into account.
2. General Means of Compliance for M2 medium robustness	6	84	Wing Aviation	The following improvements are proposed for clarity purposes: "Applicants need to declare that they achieve all three claims. However, the applicant needs to support these declarations with evidence, which should consist ofis: - a description of the mitigation means (including the activation mechanism if applicable), as per section 2.1; - a description of how this reduces the effect of ground impact in case of loss of control, as per section 2.2.1; and - a compilation of all documentation of appropriate testing, analysis, simulation, inspection, design review or operational experience. Evidence from operational experience should be supported by operation records and flight data, as per section 2.2.2. Compliance evidence associated to MoCs for any type of M2 should include the description of the mitigation means and how this reduces the effect of ground impact in case of loss of control. When the mitigation means require activation, its functioning should also be described."	Rejected	The proposed wording is ok, but some of the references (2.2.2) are not fully correct. The text below that paragraph already contains a similar compilation of guidance. The proposed change is not seen as necessary.
2. General Means of Compliance for M2 medium robustness	6	53	Schiebel LUC Organisation	in footnote 4 "contribute" needs to be replaced with "contibutuon": ...in this case, the contribute of the reduction of critical area.....in this case, the contribution of the reduction of critical area...	Accepted	the text has been updated according to your proposal.
2. General Means of Compliance for M2 medium robustness	6	45	Schiebel LUC Organisation	„The mitigation means works with sufficient reliability in the event of a loss of control“ Specify what „Sufficient reliability“ is? Is there a target level of safety associated to it?	Partially Accepted	The associated TLOS is 90%, which is layed out in the text below. We added the sentence ". More detailed guidance on how to comply can be found in the sections below."
2. General Means of Compliance for M2 medium robustness	6	24	Eric WALTER	document page 6 / Text "The activation might be combined with a termination function that ensures containment (as per step#9 of SORA) such that the mitigation means is triggered by the containment function and/or the mitigation means is an integral part of the containment function."COMMENT:At the moment, regulation 2019/947 Article 11 is based on SORA 2.0.In SORA 2.5, the Step #9 is no longer related to containment.It is understood that SORA 2.5 will be integrated in 2019/947 by end of year 2023 / beg. 2024.The key-point here is that the activation of the mitigation mean may be combined with the system ensuring containment; so possibly the reference to SORA 2.0 Step #9 could be deleted, to spare the need for an update in the future or it could be specified "as per SORA Containment step")?	noted	A revision of this document is necessary and already planned as soon as SORA 2.5 officially becomes part of the AMC to Article 11.
2. General Means of Compliance for M2 medium robustness	6	192	Thurling Aero Consulting	2. General Means of Compliance for M2 medium robustnessAny M2 mitigation should specify the supporting evidence provided to support each of the threefundamental claims:1. The mitigation means reduce the effect of ground impact2. The mitigation means works with sufficient reliability in the event of a loss of control3. The mitigation means does not introduce additional riskComment: I think this should be reworded to "The mitigation means does not increase risk," or "The mitigation means does not introduce further risk" to remain consistent with other wording in the document. Any parachute system will introduce additional elements of risk so this seems to not be feasible. It is about controlling and balancing the risk (risk versus reward), to say not to introduce additional risk is poorly worded in my opinion in such an important section.	Accepted	The wording has been adapted.

2. General Means of Compliance for M2 medium robustness	6	9	FOCA Switzerland	Regarding the sentence "All the above values and equations [...] reach the target safety gain", the sentence is unclear and provides room for interpretation by the applicant. Does this refer to the equations and values included in the section "Type 3", or applicable to the whole section 1?Remark: As this is a declarative MoC, all means of compliance, including equations/standards and target values need to be defined.	noted	It is referred not only to type 3 ("ALL"). The means of compliance are those of chapter 2.
2. General Means of Compliance for M2 medium robustness	6	160	Drone Alliance Europe	The following improvements are proposed for clarity purposes: "Applicants need to declare that they achieve all three claims. However, the applicant needs to support these declarations with evidence, which should consist ofis: - a description of the mitigation means (including the activation mechanism if applicable), as per section 2.1; - a description of how this reduces the effect of ground impact in case of loss of control, as per section 2.2.1; and - a compilation of all documentation of appropriate testing, analysis, simulation, inspection, design review or operational experience. Evidence from operational experience should be supported by operation records and flight data, as per section 2.2.2. Compliance evidence associated to MoCs for any type of M2 should include the description of the mitigation means and how this reduces the effect of ground impact in case of loss of control. When the mitigation means require activation, its functioning should also be described."	Rejected	The proposed wording is ok, but some of the references (2.2.2) are not fully correct. The text below that paragraph already contains a similar compilation of guidance. The proposed change is not seen as necessary.
2. General Means of Compliance for M2 medium robustness	6	71	AVSS	Current Text:The activation might be combined with a termination function that ensures containment (as per step#9 of SORA) such that the mitigation means is triggered by the containment function and/or the mitigation means is an integral part of the containment functionComment:- When combined with a termination function, the mitigation means should not be adversely affected by the proper or improper functioning of the termination function.- Some parachute systems use termination functions that do not work reliably, which can result in the parachute deploying with the UAS's motors still rotating, which can prevent the parachute from reaching a stable descent rate.Proposed Text:The activation might be combined with a termination function that ensures containment (as per step#9 of SORA) such that the mitigation means is triggered by the containment function and/or the mitigation means is an integral part of the containment function. When combined with a termination function, the mitigation means should not be adversely affected by the proper or improper functioning of the termination function.	Noted	No diference between sentence is noted
2. General Means of Compliance for M2 medium robustness	6	195	DroneUp	2. General Means of Compliance for M2 medium robustnessAny M2 mitigation should specify the supporting evidence provided to support each of the threefundamental claims:1. The mitigation means reduce the effect of ground impact2. The mitigation means works with sufficient reliability in the event of a loss of control3. The mitigation means does not introduce additional riskComment: I think this should be reworded to "The mitigation means does not increase risk," or "The mitigation means does not introduce further risk" to remain consistent with other wording in the document. Any parachute system will introduce additional elements of risk so this seems to not be feasible. It is about controlling and balancing the risk (risk versus reward), to say "not to introduce additional risk" is poorly worded in my opinion in such an important	Accepted	The wording has been adapted.
2. General Means of Compliance for M2 medium robustness	6	118	LBA	LBA comment on the text:"2. The mitigation means works with sufficient reliability in the event of a loss of control 3. The mitigation means does not introduce additional risk"Both cannot be achieved.How to justify the reduction of the CAn with reliability? CAn based on predifinded impact angle and attitude of aircraft. Hence no reproducabel in real life and reliability not given.Addition of any new system implies adding a risk of failure.- Describe sufficient reliability? example!LBA comment on the text:"Evidence from operational experience should be supported by operation records and flight data":Records of crashes?LBA comment on the text: "4 The need for the formula arises from the fact that the factor of 10 difference between critical areas (as per table above) associated to adjacent columns is not applicable between the 1 and the 3 m drones, therefore the simple factor CAc/CAn would not correctly represent, in this case, the contribute of the reduction of critical area to the overall risk reduction. The formula provides a linear contribute to risk reduction between the interval CAc 8 to135. E.g. 0.1 if CAc is 8 m (highest contribute), 1 if CAc is 135 m (no contribute), 0.5 if CAc = 63.5 (middle)"explanation unclear	Partially Accepted	Comment 1: The text has been updated to clarify. The question of what is considered sufficient is being explained in section 2.3. Comment 2: This refers to the activation reliability. Regarding the last comment, the new critical areas have solved the issue.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	27	Eric WALTER	document page 8 / on Text "ii. Demonstrate that an impact with a person in the most critical condition results at most in 30% probability of AIS3+ injuries"COMMENT: reference to standardisation / normative document describing the AIS scale could be recalled here.	accepted	
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	28	Eric WALTER	Document page 8 / on text "ii. Demonstrate that an impact with a person in the most critical condition results at most in 30% probability of AIS3+ injuries"COMMENT:It sounds a bit contradictory with Note 3 which states that for Medium Robustness "it is considered not appropriate to distinguish between fatality and injury levels".=> some clarification could be welcome here	accepted	
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	29	Eric WALTER	Document page 8 / on Text "iii. Ensure a maximum impact energy of less than 175 Joulesiv. Ensure a maximum transferred energy of less than 80 J in an impact with a person"COMMENT:These figures were already present in the previous AMC for LUAS.2512.References to supporting material could be added as note.	Rejected	There is no previos AMC for LUAS.2512. There was only an older draft for this current document. So this is the same document for the same purpose and it might become an official document in the near future.

2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	30	Eric WALTER	Document page 8 / on the following text in Section 2.2.2 "a. At least one representative flight test should provide the evidence of the claimed impact characteristics."COMMENT:1/ "representative" could be complemented as "representative of worst case conditions (with worst case conditions being the worst-case conditions for the mitigation means i.e. UA velocity vector and UA orientation at the time of activation, meteorological conditions, etc)2./ One single flight test may not be sufficient to provide the necessary confidence for a repetitive consistent ground impact reduction: the AMC should request more than 1 flight test to explore the extent of the distribution of results.In this prospect:1/ shortcomings of analysis and simulation should be highlighted in the reports i.e. those parameters for which the resulting effect on the critical area / lethality is poorly covered / neglected in studies or hypothesis taken which need to be confirmed by full scale experiment.2./ For each parameter the influence of which is not bounded by analysis or simulation, flight tests must be performed, with the aim of exploring the influence of the parameter - which implies to run several tests to confirm the influence of a parameter.In this prospect, the minimum number of flight tests to be run could be 3 per parameter poorly covered by analysis or simulation (the qty of 3 proposed here is arbitratry and represent a minimum; the intent is to characterize the influence of the parameter on the result).3./ Then at the end of this first step (analysis, simulation and flight tests), the critical parameters could be identified i.e. those parameters which have significant influence on the distribution of results: any mistake in the assumption may therefore affect the conclusion.=> for these parameters, possibly a second flight test campaign should be set up to confirm the hypothesis behind and make sure that the dispersion of results still allows to conclude that the ground risk is reduced by 90%.In any case, even with high confidence analysis and simulations, the minimum qty of flight test could be set to 3, to ensure better confidence on the ground impact reduction.	Partially Accepted	Please keep in mind, that there are multiple methods to achieve M2 medium, and the general means of compliance in section 2 needs to cover all methods. For many methods less flight test might be appropriate. In the end the reliable functioning for a medium robustness item is the responsibility of the manufacturer and he may of course perform more flight tests as he sees fit. The authority just needs evidence for at least one. We have added more guidance in chapter 2.2 and 2.3 to represent this.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	26	Eric WALTER	document page 7 / on Text "Integrity requirement:Medium level of integrity, criterion #1: “(a) Effects of impact dynamics and post impact hazards are significantly reduced although it can be assumed that a fatality may still occur.”"COMMENT:This sentence comes from SORA 2.0.In SORA 2.5 criterion #1 wording si more specific and introduces the principle of reducing the risk by one order of magnitude.When SORA 2.5 is introduced in regulation, this may create a discrepancy - with no effect in the intent, but which may be confusing to people who were not involved in the review process of the UAS regulation and supporting material (i.e. SORA).At the same time, recalling the requirement in the AMC remains a good practice as it spares the need for the reader to open 2019/947.PROPOSED WAY-FORWARD:1./ Either remove the recall of Integrity criterion #1, or2./ Complement it, to recall that "significantly" is to be understood as "ground risk reduced by 90%"	Rejected	This document is supposed to support applications based on SORA 2.0. There will be a scheduled update of this document, when EASA has adopted SORA 2.5. We are already using the required logic for the 90% target in this document and are clarifiying how this can be achieved.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	46	Schiebel LUC Organisation	„iii. Ensure a maximum impact energy of less than 175 Joules iv. Ensure a maximum transferred energy of less than 80 J in an impact with a person“ please provide clarification why impact energy and transferred energy to a person is decoupled – two different requirements /* Style Definitions */ table.MsoNormalTable	accepted	
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	47	Schiebel LUC Organisation	„Type 3 means: Reduction of both critical area and lethality. To claim type 3 M2, it should be possible to determine approximately which percentage of the global reduction of risk can be respectively apportioned to the reduction of critical area and which to the reduction of lethality“ Please provide clarification as to why the precentage attributed to each method is relevant. A simple calculation method is not evident - the importance of the percentage distribution is not evident.	noted	The rationale is that if the applicant has no idea of the percentage reduction for lethality and respectively critical area, then the claim of type 3 cannot be trusted as a reliable one.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	4	Rigi Technologies SA	Possible inconsistency with physic units:In 2.2.1. iii. and iv., "Joules" and "J" are used. Would it be better to keep only "J"?	Accepted	we will use "J" consistently.
2.1 Provide a description of the mitigation and the involved systems	7	10	FOCA Switzerland	On point 2.1.1, we suggest to replace the text "Describe the physical elements of the mitigation means" by "Describe the type of the claimed M2 mitigation (Type 1, Type 2 or Type 3) and the principle, including if applicable ist physical elements, associated to the mitigation means."Rationale: The description of the mitigation should include upfront an explanation of the M2 Type being claimed.The term "physical elements" can be confusing for applicants claiming a reduction of ground risk by means related to "intrisic design" characteristics such as frangibility.	Accepted	we modified the wording
2.1 Provide a description of the mitigation and the involved systems	7	11	FOCA Switzerland	Regarding point 2.1.4, we suggest to replace the whole text by "2.1.4 If applicable, document the required operational procedures for the utilization and maintenance of the mitigation means. 2.1.5 If applicable, supplement with the recommended training and instructions for the personnel responsible for these tasks, including a training syllabus supplement for the operation of the mitigation."Rationale: to improve clarity towards the applicant and it is proposed to remove the last sentence "The operator should provide competency-based, theoretical and practical knowledge", as this requirement stems directly from SORA.	Partially Accepted	we modified the wording. Since this document is tailored towards manufacturers and equipment suppliers, we kept the wording, that the designer of the mitigation needs to provide the necessary documentation to "enable" the operator to train ist personel accordingly.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	12	FOCA Switzerland	As regards point 2.2.3, we suggest to replace the whole sentence by "List any operational limitation associated with the safe operation of the mitigation in the operations manual or flight manual.", in order to improve clarity towards the applicant.	Partially Accepted	Ok, but keep in mind, that there are also component manufacturers making the necessary declarations, which require an operationas manual or flight manual supplement. We updated the text accordingly.

2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	120	LBA	LBA comment on the text"This can be demonstrated in the following ways":wording:AND or OR ? fro the following points?LBA comment: "2iii and 2iv":explanation needed. Why this specific values?How to calculate the transferred energy?LBA comment on the text:"which percentage of the global reduction of risk can be respectively":what is the global reduction of risk ?LBA comment:2.2.1 i)-iv) is this meaning "AND" or "OR"?2.2.2 a)-c) is the meaning "AND" or "OR"?LBA comment on the text "Every simulation model should be validated by means of representative tests":Therefore we cannot trust any kind of simulation if it is not based on proper tests.LBA comment to the point 2.2.3:Include an option to achieve this requirements with by COTS product which is not based upon ASTM etc..	Partially Accepted	the text has been updated according to make up for the missing "or" statement.
2.1 Provide a description of the mitigation and the involved systems	7	119	LBA	LBA comment to the points:"2.1.2 and 2.1.3:How to be fullfilled by an "end-user" operator if not the manufacteurer?LBA comment on the text:"hazard assessment":no mentioning of hazard assessment in the follwoing steps.Why to perform an additional hazard assessment unclear.	Noted	As outlined in the beginning, this document is targeted towards component as well as drone manufacturers as only they can provide the necessary evidence. The examples in the last chapters provides a direct explanation of this (a direct answer to this question); it is not sufficient the pure following of the standard, please refer to the prescription of this MoC.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	134	ISDEFE	For Type 2, how can ASTM F3389 be used to reach 90% of Ground risk reduction? It is understood it would only be applicable for UAS of less than 25kg, but additionally, could you confirm/clarify that the intention is to establish that if the standard is followed, then a 90% reduction of Ground risk reduction may be considered achieved? For example, when following method A, for the sUA operational envelope that keeps the KE of the sUA impacts below 73 J, or for method B, for the sUA operational envelope for which the KEsafe.Proposal:i. For UAS of less than 55lbf, a reduction of 90% of lethality may be claimed when ASTM F3389/F3389M-21 methodologies are followed.	Noted	
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	188	Thurling Aero Consulting	2.2.2 a. "At least one representative flight test..." is insufficient. In my experience as a Third Party Test Agency for the ASTM F3322 standard, I have seen many parachute deployments. The issue is typically not the identification of the need for the deployment, but rather the potential for entanglement during the deployment resulting in a failed deployment. This is not easy (I would say near impossible to do correctly) to simulate as the aircraft motion can be quite dynamic. This is one reason that the ASTM test has as many deploiyments as it does. I am not saying you need to go as far as the ASTM standard, but "one representative" flight test is way to low! Consider just using the ASTM F3322 standard and, if the desire is for a lighter touch at lower SAIL, then use at least one deployment from each of the ASTM conditions. This would result in 9 - 12 successful deployments.	Partially Accepted	Please keep in mind, that there are multiple methods to achieve M2 medium, and the general means of compliance in section 2 needs to cover all methods. For many methods less flight test might be appropriate. In the end the reliable functioning for a medium robustness item is the responsibility of the manufacturer and he may of course perform more flight tests as he sees fit. The authority just needs evidence for at least one. We have added more guidance in chapter 2.2 and 2.3 to represent
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	196	DroneUp	2.2.2 a. "At least one representative flight test..." is insufficient. In my experience as a Third Party Test Agency for the ASTM F3322 standard, I have seen many parachute deployments. The issue is typically not the identification of the need for the deployment, but rather the potential for entanglement during the deployment resulting in a failed deployment. This is not easy (I would say near impossible to do correctly) to simulate as the aircraft motion can be quite dynamic. This is one reason that the ASTM test has as many deploiyments as it does. I am not saying you need to go as far as the ASTM standard, but "one representative" flight test is way to few! Consider just using the ASTM F3322 standard and, if the desire is for a lighter touch at lower SAIL, then use at least one deployment from each of the ASTM conditions. This would result in 9 - 12 successful deployments.(repeat of 188)	Partially Accepted	Please keep in mind, that there are multiple methods to achieve M2 medium, and the general means of compliance in section 2 needs to cover all methods. For many methods less flight test might be appropriate. In the end the reliable functioning for a medium robustness item is the responsibility of the manufacturer and he may of course perform more flight tests as he sees fit. The authority just needs evidence for at least one. We have added more guidance in chapter 2.2 and 2.3 to represent
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	139	Board Member	Possible inconsistency with physic units: In 2.2.1. iii. and iv., "Joules" and "J" are used. Would it be better to keep only "J"?	Accepted	we will use "J" consistently.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	140	Board Member	It would be good to have an annex or a reference on where and how the Energy thresholds of 80J and 175J are determined.	Accepted	see comment 46 (footnote introduced)
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	61	Schiebel LUC Organisation	Type 1 means: to substantiate the claim, the applicant should demonstrate by analysis or test that the critical area after the application of the mitigation means is lower than the CAn of the adjacent column to the left of the one selected initially in step#2 of SORA."lower than" in above paragraph needs to be replaced it with at least "lower than or equal to; as it is in conflict with summary paragraph of 1. Nominal target for M2 mitigation with medium integrity:"All the above values and equations are provided for nominal reference. For medium robustness mitigations it is acceptable to approximately reach the target safety gain."	Accepted	we modified the wording accordingly
2.1 Provide a description of the mitigation and the involved systems	7	161	Drone Alliance Europe	The following improvement in subsection 2.1.4 is proposed: "2.1.4 If applicable, dDocument the required operational procedures for the utilization and maintenance of the mitigation means".	Accepted	we modified the wording accordingly
2.1 Provide a description of the mitigation and the involved systems	7	162	Drone Alliance Europe	Under subsection 2.1.4, we believe that theoretical training on, for instance, how to install and service a parachute is not needed: "The operator should provide competency-based, theoretical and practical training"	Partially Accepted	Section 2.1.4 deals with all kinds of mitigations, not just with parachutes. However, the sentence is misleading, as this section is on the provision of a training supplement to the operator. It has been clarified

2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	163	Drone Alliance Europe	The addition of the following text is proposed under Type 1:"1. Type 1 means: to substantiate the claim, the applicant should demonstrate by analysis or test that the critical area after the application of the mitigation means is lower than the CAn of the adjacent column to the left of the one selected initially in step#2 of SORA. The demonstration will depend on the impact dynamics (gliding, spiral, ballistic descent...). To determine the impact dynamics, use the below failure scenario which is expected to be conservative for most cases:-i) For parachutes or systems that will drift in the wind, analysis or testing should occur at maximum wind conditions.-ii) For non-drift systems, such as impact, glide or ballistic mitigations, analysis or testing should be done at maximum operating altitude at maximum commanded airspeed speed and at ½ maximum tailwind operating limits.-iii) If there are probable failure conditions which would lead to operations outside of the maximum altitude or commanded airspeed, the system should be tested under those conditions."Rationale:This should conservatively bound a significant amount of the use cases (and when averaging over a flight, present a conservative average). Doing everything at the max, plus using the conservative max values for Type 2 has overly compounding conservativeness and is an extreme edge case. Additionally, wind is a reasonable variable to not test at the maximum as, over the average flight, the average wind should be around 0 (if time averaged, it is actually a net headwind since flying slower into it), thus using the 1/2 tail wind + max speed is a conservative approach.		see comment 87
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	164	Drone Alliance Europe	The following improvement is proposed under Type 2: "2. Type 2 means: Demonstration of sufficient impact severity reduction could be achieved showing an expected probability of 90% lethality of less than or equal to 10% reduction. This can be demonstrated in the following ways: -i) ASTM F3389/F3389M-21 methodologies could be proposed where it is possible to adapt the thresholds to reach 10% lethality90% reduction. -ii) Using alternative means of showing a probability of lethality less than or equal to 10%. -iii) Using one of the following simplistic, but conservative single value approaches: • Demonstrate that an impact with a person in the most critical condition results at most in 30% probability of AIS3+ injuries5; • Ensure a maximum impact energy of less than 175 Joules; • Ensure a maximum transferred energy of less than 80 J in an impact with a person." Rationale: It should be made clear for the simplistic methods that they are easy to calculate, but conservative.	rejected	The suggestion is not understood. The propsoed text is considered clearer and more flexible (the ref to 10% is not understood)
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	165	Drone Alliance Europe	"Demonstration by simulation should be limited to cases in which testing would be highly impracticable. Every simulation model should be validated by means of representative tests." This means that, in most cases, the operator has one flight test to perform in which he could potentially damage the drone. With a well-designed simulation model, it is possible to run multiple simulations and determine the critical area based on them for many different cases (wind direction, parachute release altitude, etc.), but to that end such testing/simulation should be allowed not only in "highly impracticable" cases.	Rejected	The manufacturer can do as many flight test as he sees fit. Only a minimum of evidence for one flight test
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	166	Drone Alliance Europe	Section 2.2.1: Rationale for the maximum kinetic energy thresholds (80 J and 175 J) is required. How does EASA reach those values? What is the reasoning behind? Additional explanation is required.	accepted	footnote has been introduced
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	62	AVSS	Current Text:2. Type 2 means: Demonstration of sufficient impact severity reduction could be achievedshowing a 90% lethality reduction. This can be demonstrated in the following ways:Comment:- More clarity in the entire document is needed for the use of "can", "should", and "shall"- "Shall" must be used for items that are obligatory- "Should" is used for items that are strongly recommendedProposed Text:2. Type 2 means: Demonstration of sufficient impact severity reduction shall be achievedshowing a 90% lethality reduction. This shall be demonstrated in the following ways:	Partially Accepted	The legal classification of this document prohibits the use of "shall". However, we agree on "should" being applied more consistently.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	63	AVSS	Current Text:2. Type 2 means: Demonstration of sufficient impact severity reduction could be achievedshowing a 90% lethality reduction. This can be demonstrated in the following ways:i. ASTM F3389/F3389M-21 methodologies could be proposed where it is possible toadapt the thresholds to reach 90% reductionii. Demonstrate that an impact with a person in the most critical condition results atmost in 30% probability of AIS3+ injuries5;iii. Ensure a maximum impact energy of less than 175 Joulesiv. Ensure a maximum transferred energy of less than 80 J in an impact with a Comment:- Stronger language should be imposed here, use "shall" instead of "can"- Is it sufficient to use one of the following methods, or are all four methods required? More clarity is needed for this point.Proposed Text:2. Type 2 means: Demonstration of sufficient impact severity reduction could be achievedshowing a 90% lethality reduction. This shall be demonstrated in one of the following ways:	Partially Accepted	The legal classification of this document prohibits the use of "shall". However, we agree on "should" being applied more consistently.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	65	AVSS	Current Text:1. Type 1 means: to substantiate the claim, the applicant should demonstrate by analysis or test that the critical area after the application of the mitigation means is lower than the CAn of the adjacent column to the left of the one selected initially in step#2 of SORA. The demonstration will depend on the impact dynamics (gliding, spiral, ballistic descent...).Comment:- Guided Parachute Recovery Systems should be included in Type 1 means, as the guided parachute can decrease the critical area by steering into the wind and reducing wind drift that can propel an unguided parachute into a larger critical area.Proposed Text:1. Type 1 means: to substantiate the claim, the applicant should demonstrate by analysis or test that the critical area after the application of the mitigation means is lower than the CAn of the adjacent column to the left of the one selected initially in step#2 of SORA. The demonstration will depend on the impact dynamics (gliding, spiral, ballistic descent, guided parachute descent...).	Rejected	Either of the points can be used, the document has been ammended to better reflect that. Guided parachutes can be used to minimize critical area if the applicant can provide evidence, that this heading into the wind functionality works in all probable failure cases. While not impossible it is considered inpractical and unlikely enough to not to be added as part of the

2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	72	AVSS	Current Text:2.2.2 Compile all calculations, test evidence and other possible evidence into the report, showing that the mitigation means achieves the necessary performance target. a. At least one representative flight test should provide the evidence of the claimed impact characteristics. Parameters to be assessed after activation of the mitigation would be for example descent speed, descent angle, evidence of parts detachment, impulse, transfer energy (where applicable).Comment:- One flight test is not sufficient to calculate accurate descent speed, descent angle, and transfer energy, as these values can varry, so multiple flights are needed and average values should be calculated.- ASTM F3322 requires at least 45 flight tests, so non-ASTM parachutes should have a similar number of tests.Proposed Text: 2.2.2 Compile all calculations, test evidence and other possible evidence into the report, showing that the mitigation means achieves the necessary performance target.a. At least 45 representative flight tests should provide the evidence of the claimed impact characteristics. Parameters to be assessed after activation of the mitigation would be for example descent speed, descent angle, evidence of parts detachment, impulse, transfer energy (where applicable).	Rejected	This section does not only cover parachutes. Using a parachute however might incentivize to have more tests. In the end it is the manufacturers choice how many flight test are performed. The manufacturer declares that the parachute is sufficient and he needs to supply evidence for at least one flight test. Please also note that this flight test here is to identify the descent characteritics to be used for the critical area size assessment.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	132	AVSS	Current Text:2.2.2 Compile all calculations, test evidence and other possible evidence into the report, showing that the mitigation means achieves the necessary performance target.a. At least one representative flight test should provide the evidence of the claimed impact characteristics. Parameters to be assessed after activation of the mitigation would be forexample descent speed, descent angle, evidence of parts detachment, impulse, transfer energy (where applicable).b. Demonstration by simulation should be limited to cases in which testing would be highly impracticable. Every simulation model should be validated by means of representative tests.c. The test report should describe the conditions in which the tests took place and the outcome of each test. A summary of results should be provided.2.2.3 List any operational limitation associated with the safe operation of the mitigation.Comment:- Guided Parachute Recovery Systems can decrease the horizontal speed after deployment by turning into the wind.- The horizontal speed is the wind speed subtracted by the airspeed of the Guided Parachute.- This allows the drone to have a higher operational wind limit, while maintaining an impact kinetic energy below 175 Joules.Proposed Text:2.2.2 Compile all calculations, test evidence and other possible evidence into the report, showing that the mitigation means achieves the necessary performance target.a. At least one representative flight test should provide the evidence of the claimed impact characteristics. Parameters to be assessed after activation of the mitigation would be forexample descent speed, descent angle, evidence of parts detachment, impulse, transfer energy (where applicable), airspeed and final horizontal speed for Guided Parachute Recovery Systems.b. Demonstration by simulation should be limited to cases in which testing would be highly impracticable. Every simulation model should be validated by means of representative tests.c. The test report should describe the conditions in which the tests took place and the outcome of each test. A summary of results should be provided.2.2.3 List any operational limitation associated with the safe operation of the mitigation.	Rejected	Activation of a guided (aka controlled) parachute is not a loss of control of operation in the first place. If however in an example the guided parachute has an independent enough control system, that satisifies all the M2 requirements with the sole purpose of heading into the wind, this might be used. As this is considered a rather unusual approach we are not going to list it here and it is at the applicants discretion to claim this method.
2.1 Provide a description of the mitigation and the involved systems	7	85	Wing Aviation	The following improvement in subsection 2.1.4 is proposed: "2.1.4 If applicable, dDocument the required operational procedures for the utilization and maintenance of the mitigation means".	Accepted	we modified the wording accordingly
2.1 Provide a description of the mitigation and the involved systems	7	86	Wing Aviation	Under subsection 2.1.4, we believe that theoretical training on, for instance, how to install and service a parachute is not needed: "The operator should provide competency-based, theoretical and practical training"	Accepted	Section 2.1.4 deals with all kinds of mitigations, not just with parachutes. However, the sentence is misleading, as this section is on the provision of a training supplement to the operator. It has been clarified
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	87	Wing Aviation	The addition of the following text is proposed under Type 1: "1. Type 1 means: to substantiate the claim, the applicant should demonstrate by analysis or test that the critical area after the application of the mitigation means is lower than the CAn of the adjacent column to the left of the one selected initially in step#2 of SORA. The demonstration will depend on the impact dynamics (gliding, spiral, ballistic descent…). To determine the impact dynamics, use the below failure scenario which is expected to be conservative for most cases: -i) For parachutes or systems that will drift in the wind, analysis or testing should occur at maximum wind conditions. -ii) For non-drift systems, such as impact, glide or ballistic mitigations, analysis or testing should be done at maximum operating altitude at maximum commanded airspeed speed and at ½ maximum tailwind operating limits. -iii) If there are probable failure conditions which would lead to operations outside of the maximum altitude or commanded airspeed, the system should be tested under those conditions." Rationale: This should conservatively bound a significant amount of the use cases (and when averaging over a flight, present a conservative average). Doing everything at the max, plus using the conservative max values for Type 2 has overly compounding conservativeness and is an extreme edge case. Additionally, wind is a reasonable variable to not test at the maximum as, over the average flight, the average wind should be around 0 (if time averaged, it is actually a net headwind since flying slower into it), thus using the 1/2 tail wind + max speed is a conservative approach.	Partially Accepted	The comment is partially accepted. However the topic should be taken the other way around: "testing should occur at maximum wind conditions". There is not really a "maximum wind condition" for the test. There is a maximum wind, to be then included as operational limitation in point 2.2.3, which would still allow achievement of target reduction of critical area; and the analysis and tests should show what this maximum wind is. We also believe that specifying ½ tail wind is not needed as we already exclude wind gusts in the examples. We prefer to use "speed" instead of "airspeed" which would be potentially more demanding for

2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	88	Wing Aviation	The following improvement is proposed under Type 2: "2. Type 2 means: Demonstration of sufficient impact severity reduction could be achieved showing an expected probability of 90% lethality of less than or equal to 10% reduction. This can be demonstrated in the following ways: -i) ASTM F3389/F3389M-21 methodologies could be proposed where it is possible to adapt the thresholds to reach 10% lethality90% reduction. -ii) Using alternative means of showing a probability of lethality less than or equal to 10%. -iii) Using one of the following simplistic, but conservative single value approaches: • Demonstrate that an impact with a person in the most critical condition results at most in 30% probability of AIS3+ injuries5; • Ensure a maximum impact energy of less than 175 Joules; • Ensure a maximum transferred energy of less than 80 J in an impact with a person." Rationale: It should be made clear for the simplistic methods that they are easy to calculate, but conservative.	Rejected	see comment 164
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	112	Farada Group	Type 2 means: Demonstration of sufficient impact severity reduction could be achieved showing a 90% lethality reduction. Multiple options available. The requirements to be met in these "multiple options" are again quite demanding:- either meet the requirements from ASTM F3389/F3389M-21- or "demonstrate that an impact with a person in the most critical condition results at most in 30% probability of AIS3+ injuries."- The Kinetic energy <175J option is out because it applies to small drones- the last option is the least clear: "Ensure a maximum transferred energy of less than 80 J in an impact with a person" - We didn't notice anywhere in the instructions what "transferred energy" means - where is this energy to be transferred? Is the UAV supposed to have a crumple zone? This is unclear, and I don't remember at the workshop if this thread came up;Bottom line: the operator - if he doesn't decide to use Type 1 i.e. testing/simulation to determine the critical area then he needs to get into the details of fatality reduction again, or somehow demonstrate that "colliding with a person in the worst case results in a majority with a 30% probability of AIS3+ injuries" which seems to be no less	Partially Accepted	footnote addedd to explain difference betwwen transferred and impact KE. For the reminder, the current text is consdiered correct.
2.2 Provide evidence that the mitigation means reduces the effect of ground impact	7	110	Farada Group	Type 2 means: Demonstration of sufficient impact severity reduction could be achieved showing a 90% lethality reduction. Multiple options available. The requirements to be met in these "multiple options" are again quite demanding:- either meet the requirements from ASTM F3389/F3389M-21- or "demonstrate that an impact with a person in the most critical condition results at most in 30% probability of AIS3+ injuries."- The Kinetic energy <175J option is out because it applies to small drones- the last option is the least clear: "Ensure a maximum transferred energy of less than 80 J in an impact with a person" - We didn't notice anywhere in the instructions what "transferred energy" means - where is this energy to be transferred? Is the UAV supposed to have a crumple zone? This is unclear, and I don't remember at the workshop if this thread came up;Bottom line: the operator - if he doesn't decide to use Type 1 i.e. testing/simulation to determine the critical area then he needs to get into the details of fatality reduction again, or somehow demonstrate that "colliding with a person in the worst case results in a majority with a 30% probability of AIS3+ injuries" which seems to be no less	Partially Accepted	see comment 112
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	31	Eric WALTER	Document page 9 / on the following text in Section 2.3.1:"a) For SAIL I and II a design and installation appraisal should be available. This could be done according to ASTM F3309/F3309M-18 Simplified Safety Assessment of Systems and Equipment in Small Aircraft.b) For SAIL III and higher the safety assessment on the mitigation means should be a part of the overall system safety assessment (OSO #05, OSO 10/12)."COMMENT:This approach sounds a bit concerning:The M2 Mitigation Mean allows to reduce the GRC to yield the final GRC, which will then be used to determine the final SAIL, which in turn is used to determine some of the robustness criteria for the Mitigation Mean.From a higher perspective, an M2 at Medium Robustness (reducing iGRC by 1) will allow in most cases to go from SAIL III to SAIL II, to downgrade a SAIL IV to SAIL III (except when combined with ARC-c or -d) - and thus escape EASA DVR, to downgrade a SAIL V to SAIL IV - and escape type-certification.This is different for the OSO: their robustness level and demonstration criteria also depend on the SAIL but have no retroactive feedback affecting the SAIL level.=> to avoid the retroactive relationship b/w SAIL and M2 robustness, robustness demonstration criteria should should be based on iGRC rathar than SAIL:* iGRC 2 and 3 => SAIL I / II criteria apply* iGRC 4: SAIL III* iGRC 5: SAIL IV* iGRC 6: SAIL V* iGRC 7: SAIL VI	Rejected	The existence of an M2 mitigation as part of the system design always has an impact on the technical design OSOs. If an applicant uses M2 to realize a lower SAIL, the technical design requirements have a lower robustness. While this is iterative in nature, we do not see any negative or unsafe impact.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	101	Wing Aviation	The following improvements are proposed on the fourth paragraph under Guidance: "Operational experience may be used in support to test and/or to reduce the number of tests. The criteria should be the same as for testing. For example, if the means behaved as expected during an operation and a technical report or analysis of the occurrence exists, it may be used as flight test evidence as per the “Testing” section. The relevant aspects of the mitigation of the UAS configuration should be the same, or analysis or testing done to justify any changes. For example, the parachute attachment points to the UA structure are not changed; the materials are the same when a frangible structure is claimed."	Rejected	As examples are already given, what is meant by the UAS configuration being the same, this modification is not necessary. In the end it is the operator/manufactureres responsibilty to ensure that the mitigation works.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	33	Eric WALTER	Document page 9 / on the following text in Section 2.3.2:"b) Applicant must conduct a series of 30 representative activation tests to determine the reliability of the mitigation means and write a test report about it. All tested activations should be successful to demonstrate a 90% reliability in operation. The 30 tests are not necessarily in flight, however they need to be conducted with a configuration representative of the operation in flight and they need to exercise all the chain of elementsc) In exceptional cases in which not a single flight test is feasible,"COMMENT:Bullet c/ seem to imply that the tests required per bullet b/ just before must include some flight test.However, bullet b/ states that "The 30 tests are not necessarily in flight,".This is a bit confusing.=> it could be clarified that credit can be claimed from the flight tests performed to demonstrate the reliability of the activation of the mitigation mean.However it should also be recalled that the activation test series should cover the whole envelope of activation (i.e. UA velocity vector and UA orientation at the time of activation, meteorological conditions, etc).	Accepted	The mention of at least one representative flight test was missing in the text. The text has been updated.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	34	Eric WALTER	Document page 10 / on the following text in section 2.3.2:"Failures or improper system behaviour during tests should be analysed and the root cause identified. Failed tests shall not be repeated without having performed an appropriate analysis of the causes and where necessary, before appropriate design changes have been made.In case of malfunction of the means during testing, the applicant should continue correcting identified root causes and testing until all the issues have been solved and all tests are passed. . Provide a report of the root cause analysis and a description of the design changes to correct the issue."COMMENT:It could be clarified that "all tests are passed on the final configuration" i.e. no credit taken for successful tests on configurations for which failures were recorded.[This is actually clarified in Examples 1 to 3 - but it should be clear from Section 2]	Accepted	we modified the wording accordingly

2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	48	Schiebel LUC Organisation	„List all probable malfunctions that may cause the crash of the UA. Justify how the mitigation means can be successfully activated in these situations.“ Please specify what probability can be attributed to „probable“. This is a crucial factor for the ensuing analysis.	Rejected	The term "probable" is already explained in the SORA (AMC1 to Article 11, 2019/947).
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	50	Schiebel LUC Organisation	"Applicant must conduct a series of 30 representative activation tests to determine thereliability of the mitigation means and write a test report about it. All tested activationsshould be successful to demonstrate a 90% reliability in operation. The 30 tests are notnecessarily in flight, however they need to be conducted with a configurationrepresentative of the operation in flight and they need to exercise all the chain ofelements"Please provide clarification as to what an activation test is - what are the key parameters (impact angle, terminal velocity?) Also, 30 tests do not seem feasible - economic impact - but also due to the fact that it is unrealistic to suppose that there are enough widely available and low-threshold test centres in Europe where potential crashes are acceptable due to risk of fatalities on ground. For UAS with a wide range of meteorological limitations (wind, temperatures, humidty, etc) the feasibility of testing in these conditions (in Europe) is not given.	Rejected	The document is quite clear, that most flight tests can be done on the ground. It is already anticipated that this testing regime will probably not idenitfy the edge cases. Please keep in mind that only a 90% mitigation reliability is required for medium robustness. It is up to the manufacturer to decide on the scrutiny of its own testing regime for the medium robustness to achieve this minimum reliability.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	13	FOCA Switzerland	As regards point 2.3.1, we suggest to add a foot note "The SAIL level in paragraph 2.3.1 refers to the resulting SAIL of the operation after applying an M2 medium mitigation."It is suggested to include a footnote or remark for applicants, that the SAIL level is to be considered as the resulting SAIL after a reduction of initial ground risk by means of M2 mitigation has been accounted for.	Accepted	suggested sentence added to the guidance section.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	15	FOCA Switzerland	As regards the point 2.3.2, letter d), it is proposed to move this to a general note in section 2.3The requirement does not apply to the entire section 2.3.	Accepted	paragraph d) was removed.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	16	FOCA Switzerland	As regards "Guidance", we propose to replace the sentence "If the mitigation means are intrinsic (require no activation) no FC should lead the UAS to violate the hypothesis/limitations." by "If the mitigation means are intrinsic (require no activation) no technical or operational FC should lead the UAS to violate the hypothesis/limitations."	Rejected	benefit of this addition unclear as FC already includes these.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	121	LBA	LBA comment to the point "Integrity requirement":Independent system ? Thus some internal systems may not work, spiral decend, stall ...LBA comment on the text"2.3.1 List all probable malfunctions that may cause the crash of the UA":Hard to achieve by end user. All operator provided lists will be incomplete.LBA comment on to the point 2.3.1 a):Proper application of a SAIL 2 operator if not the manufacteurer questionable. Core issue ot the ASTM application.LBA comment on the text "2.3.2 Compile all test evidence and other possible evidence into the report, showing that the mitigation means achieves a reliability of at least 90% after activation":Why only 90%Include differentiation between SAll 1-3 and SAIL 4-62.3.2 a)-e): how to use the following case? AND or OR ? LBA comment to the point"2.3.2 b)":very good description. Please describe in detail what is meant by activation test?How to determine these test with regards to CAc and the reduction of leathality? LBA comment to the point "2.3.2 c)":see above, no flight test essential at all.Recommendation to delete the words. EASA shall not be involved in M2 Med.LBA comment to the point "Guidance":Manufacteurer applicable only.	Partially Accepted	LBA comment to the point "Integrity requirement": This requirement is in the SORA and not changed or modified here. LBA comment on the text"2.3.1 List all probable malfunctions that may cause the crash of the UA": Agreed, only manufacturer or component manfacturer can supply these lists in practice. The operator needs to have the performance assured, when he buys the mitigation/drone hardware. LBA comment on to the point 2.3.1 a): Agreed, only manufacturer or component manfacturer can supply this analysis in practice. The operator needs to have the performance assured, when he buys the mitigation/drone hardware.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	186	AIRBUS HELICOPTERS	With regard to page 8 - § 2.2.2.b. : "Demonstration by simulation should be limited to cases in which testing would be highly impracticable. Every simulation model should be validated by means of representative tests."COMMENT :Are there any existing criteria/considerations about these simulation means/models ?Moreover, the meaning of "highly impracticable" should be clarified	Rejected	LBA comment on the text "2.3.2 There are no criteria as there are many different M2 mitigation solutions. It is in the manufacturers own interest to use sufficient simulation fidelity to support the claim.

2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	193	Thurling Aero Consulting	2.3.2 b) "Applicant must conduct a series of 30 representative activation tests to determine the reliability of the mitigation means and write a test report about it..."Comment: Is the 30 tests requirement a minimum number, or a hard number? What is to prevent someone from conducting 60 tests, cherry picking the ones they like, and playing the stats to get to 90% in their report? This seems like it should have a defined range and the results of all tests must be reported. We should also make sure that "representative" tests are accomplished. Not all of them should be in the heart of the envelope. They should span the operational envelope for which the applicant is seeking approval. Lastly, the activation is the easy part to achieve (and to test), it is not getting entangled during the parachute deployment where applicants typically fall down. See my comment to section 2.2.2 (comment 188).	Noted	30 is the minimum number to achieve the desired reliability. Cherry picking is not allowed, which is explained in the guidance section. If a test fails, the count restarts. The number of representative flight tests varies greatly with the chosen mitigation method as this not only focussed on parachutes. In the end the manufacturer must be happy with the achieved performance as he is selling a product that must meet the overall performance criteria and is liable for its achieved performance.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	197	DroneUp	2.3.2 b) "Applicant must conduct a series of 30 representative activation tests to determine the reliability of the mitigation means and write a test report about it..."Comment: Is the 30 tests requirement a minimum number, or a hard number? What is to prevent someone from conducting 60 tests, cherry picking the ones they like, and playing the stats to get to 90% in their report? This seems like it should have a defined range and the results of all tests must be reported. We should also make sure that "representative" tests are accomplished. Not all of them should be in the "heart" of the envelope. They should span the operational envelope for which the applicant is seeking approval. Lastly, the activation is the easy part to achieve (and to test), it is not getting entangled during the parachute deployment where applicants typically fall down. See my comment to section 2.2.2 (comment 188).(repeat of 193)	Noted	30 is the minimum number to achieve the desired reliability. Cherry picking is not allowed, which is explained in the guidance section. If a test fails, the count restarts. The number of representative flight tests varies greatly with the chosen mitigation method as this not only focussed on parachutes. In the end the manufacturer must be happy with the achieved performance as he is selling a product that must meet the overall performance criteria and is liable for its achieved performance.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	57	Schiebel LUC Organisation	"2.3.1 List all probable malfunctions that may cause the crash of the UA. Justify how the mitigation means can be successfully activated in these situations."In case of an independent system which is used as mitigation means, a proof that justifies the independency of the system might be enough rather than listing all probable malfunctions.	Rejected	The malfunctions are those of the UA. Just because the mitigation means is independent, this does not mean, that it successfully deploys in all of the probable UA malfunctions that would lead to a crash.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	58	Schiebel LUC Organisation	b) Applicant must conduct a series of 30 representative activation tests to determine the reliability of the mitigation means and write a test report about it.It should be clearly stated how much of these 30 representative activation tests will be flight tests.	Accepted	text has been updated.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	59	Schiebel LUC Organisation	d) This requirement is not applicable to mitigations means related to “intrinsic” design characteristics of the UA like frangibility or impact energy absorbing materials that require no activation.This paragraph should be a) instead of d) to prevent misunderstandings.	Accepted	paragraph d) was removed.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	167	Drone Alliance Europe	The following improvement is proposed under Type 3: "3. Type 3 means: Reduction of both critical area and lethality. To claim type 3 M2, it should be possible to determine approximately which percentage of the global reduction of risk can be respectively apportioned to the reduction of critical area and which to the reduction of lethality."	Rejected	We cannot identify any proposal in your comment.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	168	Drone Alliance Europe	The note contained in point d) under subsection 2.3.2 should be brought forward in section 2.3 (i.e., just after quoting the integrity requirement), as it is applicable to the whole section. "This requirement is not applicable to mitigations means related to “intrinsic” design characteristics of the UA like frangibility or impact energy absorbing materials that require no activation."	Accepted	paragraph d) was removed.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	169	Drone Alliance Europe	The following improvement is proposed under subsection 2.3.1: "2.3.1 List all probable malfunctions that may cause the crash of the UA. Justify how the mitigation means can be successfully activated in each of these situations"	Accepted	text has been updated.

2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	170	Drone Alliance Europe	In point b) of subsection 2.3.2, it is suggested replacing 30 with 20: "b) Applicant must conduct a series of 230 representative activation tests to determine the reliability of the mitigation means and write a test report about it. All tested activations should be successful to demonstrate a 90% reliability in operation. The 230 tests are not necessarily in flight, however they need to be conducted with a configuration representative of the operation in flight and they need to exercise all the chain of elements." Rationale: Both 20 and 30 tests can show the 90% reliability number, but at different levels of confidence. While 30 tests provides a 95% confidence level, 20 tests still provides a 86.5% confidence level. In other words, it is not considered risk proportionate a 50% increase in cost for only an 8.5% increase in the confidence level, taking into account that this can be substantial in terms of resources/costs and/or time spent.	Rejected	Based on the rule of 3 the number of positive outcome tests needs to be 30 in order to have a reliability of 90%
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	171	Drone Alliance Europe	The following improvements are proposed on the fourth paragraph under Guidance: "Operational experience may be used in support to test and/or to reduce the number of tests. The criteria should be the same as for testing. For example, if the means behaved as expected during an operation and a technical report or analysis of the occurrence exists, it may be used as flight test evidence as per the “Testing” section. The relevant aspects of the mitigation of the UAS configuration should be the same, or analysis or testing done to justify any changes. For example, the parachute attachment points to the UA structure are not changed; the materials are the same when a frangible structure is claimed."	Rejected	As examples are already given, what is meant by the UAS configuration being the same, this modification is not necessary. In the end it is the operator/manufactureres responsibilty to ensure that the mitigation works.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	66	AVSS	Current Text:2.3.2 Compile all test evidence and other possible evidence into the report, showing that the mitigationmeans achieves a reliability of at least 90% after activation.Comment:- Does this mean that for a parachute system the parachute deploys and inflates 90% of the time?- This should be substantiated by ASTM F3322 testing, and integrators should be forced to disclose the amount of failures of the system during this testing.Proposed Text:2.3.2 Compile all test evidence and other possible evidence into the report, showing that the mitigationmeans achieves a reliability of at least 90% after activation.f) ASTM F3322 testing should be used to determine the reliability of the mitigation and all failures during this testing should be reported in the final test report given by the TPTA.	Rejected	ASTM F3322 testing would only apply for parachute systems, while 2.3.2 applies to all possible mitigation measures. Keep in mind that ASTM F3322 is generally more suitable for M2 High which is to be design verified by EASA. For M2 medium it is within the manufacturers responsibilty to assure that the 90% is met, so it is generally at the manufacturers discretion, how much is tested. As a minimum set the given requirements are expected to be sufficient
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	107	AVSS	Current Text:2.3.2 Compile all test evidence and other possible evidence into the report, showing that the mitigation means achieves a reliability of at least 90% after activation. a) This may be done by component testing, flight testing, operational experience or a combination of the above. i) Tests may be substituted by operational experience where the mitigation means has been in operation with the same configuration and with the same UAS as planned to be demonstrated for b) Applicant must conduct a series of 30 representative activation tests to determine the reliability of the mitigation means and write a test report about it. All tested activations should be successful to demonstrate a 90% reliability in operation. The 30 tests are not necessarily in flight, however they need to be conducted with a configuration representative of the operation in flight and they need to exercise all the chain of elementsComment:- ASTM F3322 should be a requirement to demonstrate the reliability of mitigation means for parachute recovery systems.- Furthermore, competent authorities should review ASTM F3322 reports in order to ensure that testing was conducted properly according to the standard.- An ASTM F3322-22 review checklist is attached below as an example of what the competent authority should review in order to ensure that ASTM F3322 is followed correctly by the integrator.Proposed Text:2.3.2 Compile all test evidence and other possible evidence into the report, showing that the mitigation means achieves a reliability of at least 90% after activation.a) This may be done by component testing, flight testing, operational experience or a combination of the above.i) Tests may be substituted by operational experience where the mitigation means has been in operation with the same configuration and with the same UAS as planned to be demonstrated forb) Applicant must conduct a series of 30 representative activation tests to determine the reliability of the mitigation means and write a test report about it. All tested activations should be successful to demonstrate a 90% reliability in operation. The 30 tests are not necessarily in flight, however they need to be conducted with a configuration representative of the operation in flight and they need to exercise all the chain of elements.For parachute recovery systems, ASTM F3322 must be passed in order to determine the reliability of the mitigation means.	Rejected	ASTM F3322 testing would only apply for parachute systems, while 2.3.2 applies to all possible mitigation measures. Keep in mind that ASTM F3322 is generally more suitable for M2 High which is to be design verified by EASA. For M2 medium it is within the manufacturers responsibilty to assure that the 90% is met, so it is generally at the manufacturers discretion, how much is tested. As a minimum set the given requirements are expected to be sufficient
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	97	Wing Aviation	The following improvement is proposed under Type 3: "3. Type 3 means: Reduction of both critical area and lethality. To claim type 3 M2, it should be possible to determine approximately which percentage of the global reduction of risk can be respectively apportioned to the reduction of critical area and which to the reduction of lethality."	Rejected	We cannot identify any proposal in your comment.

2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	98	Wing Aviation	The note contained in point d) under subsection 2.3.2 should be brought forward in section 2.3 (i.e., just after quoting the integrity requirement), as it is applicable to the whole section. "This requirement is not applicable to mitigations means related to “intrinsic” design characteristics of the UA like frangibility or impact energy absorbing materials that require no activation."	Partially Accepted	The paragraph was removed.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	99	Wing Aviation	The following improvement is proposed under subsection 2.3.1: "2.3.1 List all probable malfunctions that may cause the crash of the UA. Justify how the mitigation means can be successfully activated in each of these situations"	Accepted	text has been updated.
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	100	Wing Aviation	In point b) of subsection 2.3.2, it is suggested replacing 30 with 20: "b) Applicant must conduct a series of 230 representative activation tests to determine the reliability of the mitigation means and write a test report about it. All tested activations should be successful to demonstrate a 90% reliability in operation. The 230 tests are not necessarily in flight, however they need to be conducted with a configuration representative of the operation in flight and they need to exercise all the chain of elements." Rationale: Both 20 and 30 tests can show the 90% reliability number, but at different levels of confidence. While 30 tests provides a 95% confidence level, 20 tests still provides a 86.5% confidence level. In other words, it is not considered risk proportionate a 50% increase in cost for only an 8.5% increase in the confidence level, taking into account that this can be substantial in terms of resources/costs and/or time spent.	Rejected	Based on the rule of 3 the number of positive outcome tests needs to be 30 in order to have a reliability of 90%
2.3 Provide evidence that the mitigation means works with sufficient reliability in the event of a loss of control	8	32	Eric WALTER	Document page 9 / on the following text in section 2.3.1:"b) For SAIL III and higher the safety assessment on the mitigation means should be a part of the overall system safety assessment (OSO #05, OSO 10/12)."COMMENT:For SAIL IV and above, OSO #04 must be considered as well.=> the AMC should recall it explicitely.	Rejected	OSO #04 contains no reqirements for a system safety assessment. It refers to the need of using an acceptable airworthiness design standard, which in turn might have such a requirement, but these are superseded by OSO#05,#10/12 anyway.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	35	Eric WALTER	Document page 10 / on the following text in Section 2.4.1:"This is a SAIL dependent requirement, as the risk of adverse safety affect must become smaller with rising SAIL."COMMENT:This approach sounds a bit concerning:The M2 Mitigation Mean allows to reduce the GRC to yield the final GRC, which will then be used to determine the final SAIL, which in turn is used to determine some of the robustness criteria for the Mitigation Mean.From a higher perspective, an M2 at Medium Robustness (reducing iGRC by 1) will allow in most cases to go from SAIL III to SAIL II, to downgrade a SAIL IV to SAIL III (except when combined with ARC-c or -d) - and thus escape EASA DVR, to downgrade a SAIL V to SAIL IV - and escape type-certification.This is different for the OSO: their robustness level and demonstration criteria also depend on the SAIL but have no retroactive feedback affecting the SAIL level.=> to avoid the retroactive relationship b/w SAIL and M2 robustness, robustness demonstration criteria should should be based on iGRC rathar than SAIL:* iGRC 2 and 3 => SAIL I / II criteria apply* iGRC 4: SAIL III* iGRC 5: SAIL IV* iGRC 6: SAIL V* iGRC 7: SAIL VI	Rejected	As the SAIL is concluded after the mitigation is introduced, our approach is actually correct. The likelihood of inadvertent activation must be compatible (aka be in the same order of magnitude) with the resulting SAIL. Inadvertend activation for example does not mean, that somebody gets hurt, but it always counts as loss of control of operation. In the end the culminated number of loss of controls of operation must always be in the correct overall operational reliability bracket.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	113	Farada Group	Medium level of robustness, criterion #1c) When applicable, any failure or malfunction of the proposed mitigation itself (e.g. inadvertent activation) does not adversely affect the safety of the operation.”In the Guidence we have an example: "If a UAS design is reliable enough to fly operations up to a given SAIL, the introduction of the mitigation means should not decrease its safety performance. For example, if a UAS is designed to have a failure every 1000 hours, a parachute that is inadvertently activated every 100 hours will lead to have ten times more crashes than expected from the UAS."The question is on what basis does the manufacturer assume that a failure of a particular subsystem will occur every 100/1000/10000h? On what basis can it be assumed that accidental parachute activation will occur every 100/1000/10000h? Neither the manufacturer of the parachute provides such data, nor do we have such data, and thus we can assume that it is negligible.	Partially Accepted	You are mixing up technical design realiabilties (e.g. MTBF) and the modeled operational realiabilty of the SORA SAILs. The latter reliabilities are considering the whole operation holistically and sum up all loss of control causes (technical, organisational, training issues, etc.). This number is eventually operator dependent and is not measured/demonstrated to obtain an authorisation but should be monitored as part of oversight. We have clarified the example to better represent this.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	37	Eric WALTER	document page 11 / on the following text in section 2.4.1:"iii. SAIL III and higher: inadvertent activations need to be considered as part of the system safety assessment as required by OSO#05."COMMENT:It is understood that for SAIL III and IV, compliance demonstration with OSO#05 will be based on LUAS.2510 AMC.I did not have the opportunity to read the draft version - I hear however that for SAIL III, the probability of occurrence of failures will not be quantitative but will remain qualitative.So how can such a qualitative approach demonstrate that the rate of spurious activation of the M2 is not higher than the target LoC (starting from SAIL III)?As an alternative, exposure through an FTB approach should be acceptable - so same approach as for SAIL II, but the exposure time depends on SAIL (as per EASA MoC FTB).	noted	We agree, that FTB approach is equally sufficient to comply with 2.4.1. for SAIL III and higher. This will be covered in future versions of SORA, which officially introduced FTB as a possible means of compliance for all OSO.

2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	38	Eric WALTER	Document page 11 / on the following text in section 2.4.2:"Explain how a failure or malfunction of the mitigation does not adversely increase the loss of control rate."COMMENT:This section is a bit confusing.M2 acceptability is based on:* efficiency of ground risk reduction* reliability of the ground risk reduction mean* absence of adverse effect on the SAIL LoC level=> with respect to this last point, the need to differentiate b/w the rate of spurious activation and the rate of failure / malfunction affecting LoC is not obvious and should be clarified.Alternatively, it is suggested to merge 2.4.1 and 2.4.2:* 2.4.1: Demonstrate that the rate of failures of the mitigation mean that could generate a Loss Of Control is commensurate with the SAILThen the assessment should still: * cover the identification and review of both spurious activation and other failures and malfunctions that could lead to a loss of control (identification of mitigation means FC), and then:* assess the rate of occurence and demonstrate that it remains lower than the target LoC rate for the operation (SAIL as set by the SAIL).	Noted	the comment requires to cover the identification and review of both spurious activation and other failures and malfunctions that could lead to a loss of controt together. However, triggering of the mitigation means when not due ("spurious activations") and malfunctioning of the mitigation means after activation are topics treated by SORA M2 in 2 separate prescriptions, therefore managed in separate prescriptions by this MoC to the SORA M2. The comment should be provided to SORA 2.5. Consider anyway that with medium robustness, as defined by this MoC, a partially qualitative approach is acceptable. The comment could be further considered for high robustness.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	17	FOCA Switzerland	It is proposed to replace the text "2.4 Provide evidence that the mitigation means does not introduce additional risk for people" by "2.4 Provide evidence that the mitigation means does not introduce additional risk to third parties".Rationale: The M2 mitigation should not introduce additional risk to people on ground, and other airspace users. The term "third parties" is best suited.	Accepted	text has been updated according to your proposal.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	18	FOCA Switzerland	As regards 2.4.1, it is suggested to replace the text "Explain how inadvertent activation of the mitigation does not negatively affect the expected loss of control rate for an operation." by "If applicable, explain how inadvertent activation of the mitigation does not negatively affect the expected loss of control rate for an operation."Rationale: In case of mitigation by intrisic design of the UAS, this section should not be applicable.	noted	It is true but it is considered that the explanation in this could still be (very simply) provided.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	122	LBA	LBA comment to the point "2.4.1 iii:Further explanation needed. No connection between M2 and the SAIL.Why only from SAIL 3 upwards?	Noted	
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	60	Schiebel LUC Organisation	a. The applicant should assess risks to persons linked with any intended or unintended behaviour of the mitigation means other than inadvertent activation above.Does person linked refer to involved persons? If so, involved persons should be prefered in order to preserve integrity with EU 2019/947. If not, it should be elaborated.	Partially Accepted	We agree, that clarity is needed, but since SORA only deals with risk to uninvolved persons, this was clarified in the text accordingly
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	172	Drone Alliance Europe	The note contained in point d) under subsection 2.3.2 should be also reflected here just after quoting the integrity requirement, as it is applicable to this section as well. "This requirement is not applicable to mitigations means related to “intrinsic” design characteristics of the UA like frangibility or impact energy absorbing materials that require no activation."	Accepted	paragraph d) was removed.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	173	Drone Alliance Europe	The following improvement is proposed on subsection 2.4.1: "2.4.1 Explain how inadvertent activation of the mitigation does not negatively affect the expected loss of control rate for an operation beyond acceptable levels" Rationale: If this clarification is not added, it is nearly impossible to prove never having a negative effect.	Accepted	the text has been updated according to your proposal.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	174	Drone Alliance Europe	Applying the same logic as before, the following improvement is proposed on subsection 2.4.2: "2.4.2 Explain how a failure or malfunction of the mitigation does not adversely increase the loss of control rate beyond acceptable levels"	Accepted	text has been updated according to your proposal.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	175	Drone Alliance Europe	Applying the same logic as before, the following improvement is proposed on point b) of subsection 2.4.2: "b. A mitigation means should not create unacceptable riskadditional danger for the people on the ground or other airspace users in case of a malfunction."	Accepted	text has been updated.

2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	176	Drone Alliance Europe	The following improvements are proposed in the Guidance: "Because of inadvertent activation the means might be activated when they are not required. This could undermine the hypothesis at the basis of a SORA according to which, a UAS that conforms to the OSOs should achieve a given reliability depending on the SAIL. If a UAS design is reliable enough to fly operations up to a given SAIL, the introduction of the mitigation means should not decrease its safety performance below that threshold. For example, if a UAS is designed to have a failure every 1000 hours, a parachute that is inadvertently activated every 100 hours will lead to have ten times more crashes than expected from the UAS."	Noted	The modeled reliabilities of the SORA SAILS are considering the whole operation holistically and sum up all loss of control causes (technical, organisational, training issues, etc.). This number is eventually operator dependent and is not measured/demonstrated to obtain an authorisation but should be monitored as part of oversight. The text has been changed to improve clarity. Since we now refer to operational safety performance, your proposal is no longer applicable. Besides, there is no actual threshhold to be met.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	67	AVSS	Current Text:2.4.1 Explain how inadvertent activation of the mitigation does not negatively affect the expected loss ofcontrol rate for an operation.a. This is a SAIL dependent requirement, as the risk of adverse safety affect must become smaller with rising SAIL. In order to comply with requirement (c) the probability of inadvertent activation of the means should be commensurate with the Safety Objective of the UAS.i. SAIL I operation: the safety objective for inadvertent activation is assumed metii. SAIL II operations: inadvertent activations should not be experienced in the testing of the system as per chapter 1.1 (General principles). A test report is considered to be sufficient evidence.iii. SAIL III and higher: inadvertent activations need to be considered as part of the system safety assessment as required by OSO#05.Comment:- Guided Parachutes reduce the risk of adverse safety to the operation even during inadvertent activation, as these systems can control the landing and avoid drifting outside the operational volume.Proposed Text:2.4.1 Explain how inadvertent activation of the mitigation does not negatively affect the expected loss ofcontrol rate for an operation.a. This is a SAIL dependent requirement, as the risk of adverse safety affect must become smaller with rising SAIL. In order to comply with requirement (c) the probability of inadvertent activation of the means should be commensurate with the Safety Objective of the UAS and/or, in the case of PRS, a guided parachute should be used.i. SAIL I operation: the safety objective for inadvertent activation is assumed metii. SAIL II operations: inadvertent activations should not be experienced in the testing of the system as per chapter 1.1 (General principles). A test report is considered to be sufficient evidence.iii. SAIL III and higher: inadvertent activations need to be considered as part of the system safety assessment as required by OSO#05 unless a guided parachute is used, in which case a test report should be provided with the accuracy results of landings using a	Rejected	Activation of a guided (aka controlled) parachute is not a loss of control of operation in the first place. Section 2.4 adresses negative effects of the mitigation mechanism on the expected loss of control rate only.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	104	Wing Aviation	Applying the same logic as before, the following improvement is proposed on subsection 2.4.2: "2.4.2 Explain how a failure or malfunction of the mitigation does not adversely increase the loss of control rate beyond acceptable levels"	Accepted	text has been updated according to your proposal.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	105	Wing Aviation	Applying the same logic as before, the following improvement is proposed on point b) of subsection 2.4.2: "b. A mitigation means should not create unacceptable riskadditional danger for the people on the ground or other airspace users in case of a malfunction."	Accepted	text has been updated.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	106	Wing Aviation	The following improvements are proposed in the Guidance: "Because of inadvertent activation the means might be activated when they are not required. This could undermine the hypothesis at the basis of a SORA according to which, a UAS that conforms to the OSOs should achieve a given reliability depending on the SAIL. If a UAS design is reliable enough to fly operations up to a given SAIL, the introduction of the mitigation means should not decrease its safety performance below that threshold. For example, if a UAS is designed to have a failure every 1000 hours, a parachute that is inadvertently activated every 100 hours will lead to have ten times more crashes than expected from the UAS."	Noted	The modeled reliabilities of the SORA SAILS are considering the whole operation holistically and sum up all loss of control causes (technical, organisational, training issues, etc.). This number is eventually operator dependent and is not measured/demonstrated to obtain an authorisation but should be monitored as part of oversight. The text has been changed to improve clarity. Since we now refer to operational safety performance, your proposal is no longer applicable. Besides, there is no actual threshhold to be met.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	102	Wing Aviation	The note contained in point d) under subsection 2.3.2 should be also reflected here just after quoting the integrity requirement, as it is applicable to this section as well. "This requirement is not applicable to mitigations means related to “intrinsic” design characteristics of the UA like frangibility or impact energy absorbing materials that require no activation."	Accepted	paragraph d) was removed.
2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	103	Wing Aviation	The following improvement is proposed on subsection 2.4.1: "2.4.1 Explain how inadvertent activation of the mitigation does not negatively affect the expected loss of control rate for an operation beyond acceptable levels" Rationale: If this clarification is not added, it is nearly impossible to prove never having a negative effect.	Accepted	the text has been updated according to your proposal.

2.4 Provide evidence that the mitigation means does not introduce additional risk for people	10	36	Eric WALTER	Document page 11 / on the following text in section 2.4.1:"ii. SAIL II operations: inadvertent activations should not be experienced in the testing of the system as per chapter 1.1 (General principles). A test report is considered to be sufficient evidence."COMMENT:There is no Chapter 1.1.Chapter 1 does not address testing requirements.While the introduction to Chapter 2 mentions testing, it is not very specific.=> possibly, the reference should point at 2.2 and 2.3?It is a bit concerning however as the tests required in 2.2 and 2.3 consist in activating the mitigation mean - so the exposure time for untimely activation is quite reduced in the end...=> an exposure time of 300 FH (rule of three / FTB based) of the UAS with the mitigation mean could be used here.	Accepted	Good catch. This needs to refer to 2.3.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	41	Eric WALTER	Document page 13 / on the following text in Section "Compliance to 2.2 - Evidence for the reduction of ground impact effects":"b) For UAS in 3m size class weighing between 11 kg and 25 kg with a parachute descent rate below or at 6 m/s,"COMMENT:In bullet a/ for an UA with a MTOM of 11 kg, the parachute descent rate is estimated at 10 m/s, combining wind and descent speeds.So wind is not taken into account in bullet b/, is it not?	Aknowledged	Wind speed and parachute descent rate are taken into account in both cases.
3. Compliance examples	12	111	Farada Group	„M2 medium has many different possible implementations and is highly dependend on the utilized drone."Of the 4 examples proposed in the document - 3 are for PRS (Parachute Recovery System), and the fourth assumes kinetic energy <175J i.e. for a C0/C1 class drone not suitable for most professional applications (small size, low payload). There are no ideas for other applications despite "many different possible implementations," and even if we wanted to use some unique materials for the drone, maybe airbags or a combination of PRS and airbags - the MoC does not mention how to approach such a mitigation.	Rejected	Chapter 2 provides measurement means for the industry to develop and use other means of M2 mitigation. If the industry can provide an other example of the mitigation means then this can be added as an example.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	40	Eric WALTER	Document page 13 / on the following text in Section "Compliance to 2.2 - Evidence for the reduction of ground impact effects""a) For UAS below or at the MTOM of 11kg equipped with a parachute descent rate below or at 6 m/s, the lethality reduction can be estimated to be more than 90%. This is estimated by combining worst case collision tests, the maximum impact speed of 10 m/s (combining wind speed and descent speed)"COMMENT:Not 100% Clear:* parachute descent speed is estimated to be 6 m/sec.* max wind speed reported in Table 1 is reported to be 8 m/sec.So in the worst-case, top impact speed should be 14 m/sec., no?	Rejected	The combination speed vector is 10 m/s due to wind direction being at 90 degrees angle to the descent rate direction.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	42	Eric WALTER	Document page 13 / on the following text in Section "Compliance to 2.2 - Evidence for the reduction of ground impact effects":"Estimated critical area with the parachute (3m+2.4m)x3m = 16.2 m2"COMMENT:Per SORA 2.5 Annex F § 2.3.1, a buffer should be added to the UA max. dimension.This does not seem to be considered here: the AMC should provide some explanation for that (it is understood that up to 1 m buffer, the target objective of Claimed Critical Area equal to 20% of the Nominal Critical Area would still be reached).	Accepted	Annex F has a human width 0.3m buffer included in the calculated critical area. Calculation aligned with Annex F.
3. Compliance examples	12	2	Rigi Technologies SA	In Examples 1 and 2, it is required to establish a maximum wind speed at ground level of 8 m/s. What is the exact meaning of ground level? 0 m AGL?Please provide a definition or a reference to the definition in the text.	Aknowledged	Delete reference to "on the ground" due to the confusion it causes. Any measurement is ok.
3. Compliance examples	12	3	Rigi Technologies SA	Examples 1, 2 and 3 include a wind speed limitation at ground level. 8 m/s is very limiting. Would it be possible to allow for higher maximum wind speeds at ground level by compensating through other ways?For example, by compensating the impact energy through other means: reducing the parachute descent rate and/or reducing the MTOW.In Examples 1 and 2, the limits are:MTOW: <25 kgDescent rate: < 6 m/sWind speed at ground level: < 8 m/sFor example: if a UAS within the strict limits is assumed and the horizontal speed of the UAS is exactly the wind speed, the total speed is 10 m/s, which leads to a kinetic energy of 1250 J.In that case, if our assumptions are correct and we need to stay below 1250 J, the following example would potentially comply with that situation:MTOW: 20 kgDescent rate: 5 m/sMax kinetic Energy: 1250 JTherefore, the maximum wind speed at ground that results in a kinetic energy of 1250 J is 10 m/sPlease provide information in the document to understand if this interpretation of the hypothesis and limits is correct and, in that case, if this trade-off is acceptable (similar to what JARUS Annex F proposes between characteristic dimension, population density and max cruise speed).	Partially accepted	Combination speed vector 10m/s or below is the limiting factor from existing impact studies. Different descent rate and wind speed combination are allowed.
3. Compliance examples	12	123	LBA		Rejected	No comment ignored
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	189	Thurling Aero Consulting	-3.1.24 minimum deployable altitude, MDAThis is a comment on the MDA in general and applies throughout the examples. In my experience as a TPTA for the ASTM F3322 standard, I have witnessed a large discrepancy between the MDA seen in hover versus the MDA calculated from all test points. The latter is the method required in the current F3322. However, I would recommend that MDA be computed in the same manner as described in ASTM F3322, but that an MDA from the test points in hover be computed separately from the test points in forward flight. This will allow the appropriate MDA to be calculated for the conditions.	Rejected	ASTM standard is adopted for example 1 unaltered
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	198	DroneUp	-3.1.24 minimum deployable altitude, MDAThis is a comment on the MDA in general and applies throughout the examples. In my experience as a TPTA for the ASTM F3322 standard, I have witnessed a large discrepancy between the MDA seen in hover versus the MDA calculated from all test points. The latter is the method required in the current F3322. However, I would recommend that MDA be computed in the same manner as described in ASTM F3322, but that an MDA from the test points in hover be computed separately from the test points in forward flight. This will allow the appropriate MDA to be calculated for the conditions.(repeat of 189)	Rejected	ASTM standard is adopted for example 1 unaltered
3. Compliance examples	12	141	Board Member	In Examples 1 and 2, it is required to establish a maximum wind speed at ground level of 8 m/s. What is the exact meaning of ground level? 0 m AGL? Please provide a definition or a reference to the definition in the text.	Aknowledged	Delete reference to "on the ground" due to the confusion it causes. Any measurement is ok.
3. Compliance examples	12	142	Board Member	In Examples 1 and 2, it is required to establish a maximum wind speed at ground level of 8 m/s. What is the exact meaning of ground level? 0 m AGL? Please provide a definition or a reference to the definition in the text.	Aknowledged	Delete reference to "on the ground" due to the confusion it causes. Any measurement is ok.

3. Compliance examples	12	143	Board Member	Examples 1, 2 and 3 include a wind speed limitation at ground level. 8 m/s is very limiting. Would it be possible to allow for higher maximum wind speeds at ground level by compensating through other ways? For example, by compensating the impact energy through other means: reducing the parachute descent rate and/or reducing the MTOW. In Examples 1 and 2, the limits are: MTOW: <25 kg Descent rate: < 6 m/s Wind speed at ground level: < 8 m/s For example: if a UAS within the strict limits is assumed and the horizontal speed of the UAS is exactly the wind speed, the total speed is 10 m/s, which leads to a kinetic energy of 1250 J. In that case, if our assumptions are correct and we need to stay below 1250 J, the following example would potentially comply with that situation: MTOW: 20 kg Descent rate: 5 m/s Max kinetic Energy: 1250 J Therefore, the maximum wind speed at ground that results in a kinetic energy of 1250 J is 10 m/s Please provide information in the document to understand if this interpretation of the hypothesis and limits is correct and, in that case, if this trade-off is acceptable (similar to what JARUS Annex F proposes between characteristic dimension, population density and max cruise speed).	Partially accepted	Combination speed vector 10m/s or below is the limiting factor from existing impact studies. Different descent rate and wind speed combination are allowed.
3. Compliance examples	12	144	Board Member	While the limit of 8 m/s is suitable for many consumer drones, for many applications this is not a threshold that can be used in practice (especially for flights at higher altitudes or over longer distances). We suggest to add additional examples with more flexibility on the wind speed limit (without 8 m/s limitation).	Partially accepted	Combination speed vector 10m/s or below is the limiting factor from existing impact studies. Different descent rate and wind speed combination are allowed.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	177	Drone Alliance Europe	Wind speed limitation at ground level up to 8 m/s may be restrictive. Additional examples with combinations MTOW/wind speed/descent rate for wind speeds over 8 m/s are required.	Partially accepted	Combination speed vector 10m/s or below is the limiting factor from existing impact studies. Different descent rate and wind speed combination are allowed.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	179	Drone Alliance Europe	Drone Alliance Europe would like to ask for clarification on the third-party testing agency (TPTA): could this correspond to the concept of notified body / conformity assessment body as per Delegated Regulation (EU) 2019/945?	Rejected	ASTM standard adopted unchanged.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	180	Drone Alliance Europe	Definition of wind measurement at ground level is required. 1.8 m AGL liike an average person holding a wind measurement device in their hands?	Aknowledged	Delete reference to "on the ground" due to the confusion it causes. Any measurement is ok.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	68	AVSS	Current Text:UAS Operator requirements for a declaration to a competent authorityThe UAS operator should submit together with the declaration for a M2 mitigation:• description of the mitigation and the involved UAS systems (showing compliance to the example 1 scope)• installation and maintenance instructions for the PRS• description of the training given to remote crew on the PRSThe UAS operator must be able to get the full TPTA report from the parachute integrator, if a competent authorityrequests to see the report.Comment:- The TPTA report should be made public so that customers can make informed decisions based on the performance during ASTM F322 testing.- This would ensure that performance metrics are not falsely marketed by parachute manufacturers.Proposed Text:UAS Operator requirements for a declaration to a competent authorityThe UAS operator should submit together with the declaration for a M2 mitigation:• description of the mitigation and the involved UAS systems (showing compliance to the example 1 scope)• installation and maintenance instructions for the PRS• description of the training given to remote crew on the PRSThe UAS operator must be able to get the full TPTA report from the parachute integrator, if a competent authorityrequests to see the report.	Rejected	Currently no way in regulation to allow placing requirements on manufacturers.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	69	AVSS	Current Text:OL #2 Minimum flight altitude (AGL)ASTM F3322-18 chapters:-3.1.24 minimum deployable altitude, MDA-3.1.25Comment:- The minimum deployable altitude (MDA) shall be calculated using the method in the version of the ASTM F3322 standard in which the integrator passed third party testing (e.g. if the integrator passed ASTM F3322-18, then the MDA must be calculated using the method in ASTM F3322-18: 2x the riser length + the altitude loss from failure to 90% of the stable descent rate in the worst outlier trial, for ASTM F3322-22 the MDA is 5 meters + the altitude loss from failure to 90% of the stable descent rate in the worst outlier trial)Proposed Text:OL #2 Minimum flight altitude (AGL)ASTM F3322-18 chapters:-3.1.24 minimum deployable altitude, MDA (calculated in the method described in the version of ASTM F3322 that was passed by the integrator)-3.1.25	Rejected	Example 1 is a parachute according to an unaltered ASTM F3322-18 methodology.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	70	AVSS	Current Text:Compliance to 2.2.1 is achieved in the following way. The parachute is a Type 3 mitigation means reducing the impacted area and the severity of a potential impact with a person.a) For UAS below or at the MTOM of 11kg equipped with a parachute descent rate below or at 6 m/s, the lethality reduction can be estimated to be more than 90%. This is estimated by combining worst case collision tests7, the maximum impact speed of 10 m/s (combining wind speed and descent speed) and the fact that a direct UA centre of gravity hit to a person's head is extremely unlikely8.Comment:- Collision tests were mentioned but no report or metrics were given to substantiate the claim that there is a 90% reduction in lethality.- The wind speed is mentioned in relation to the maximum impact speed, but it is not imposed on the integrator to set the operational limit to that wind speed (which is the case in ASTM F3389 Method D)	Aknowledged	The operational wind speed limit was made clearer.
Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	131	AVSS	Current Text:Table 1 - Operational limitationsASTM F3322-18 chapters:-3.1.24 minimum deployable altitude, MDA-3.1.25Comment:- The ASTM F3322-18, and -22, standards consider only one MDA when two should be calculated, since the MDA from hover and from full forward can differ greatly.- For drones that use a winch system, the MDA at hover during winch delivery should be different (typically much lower), than the worst case outlier from ASTM F3322 testing, which is typically from full forward single motor failure.Proposed Text:Table 1 - Operational limitationsASTM F3322-18 chapters:-3.1.24 minimum deployable altitude, MDA-3.1.25Minimum Deployable Altitude (MDA)- As defined in ASTM F3322-XX-Maximum MDA for only Hover scenarios in ASTM F3322-XX	Rejected	ASTM standard is adopted for example 1 unaltered

Example #1: ASTM compliant Parachute Recovery System (PRS) for sUAS (type 3)	12	114	Farada Group	Parachute (as a system: PRS - Parachute Recovery System) must be tested by an integrator - an entity (in accordance with ASTM F3322 - 18) that will perform parachute tests on a given UA model and provide a report in the form of TPTA - in our case, the use of GBS parachutes, which are mounted by us on our drones does not contribute anything to mitigation, we would have to outsource the testing of GBS's on our drones to an integrator - the question is whether there is such an entity in Europe that will undertake the tests and issue a TPTA report? (topic already raised above)	Rejected	ASTM standard is adopted for example 1 unaltered
3. Compliance examples	12	39	Eric WALTER	GENERAL comment on Lethality reduction demonstration examples:Examples 1 to 3 provide conclusions about the reduction of lethality probability, pointing some studies as reference.The justifications are however quite quick and a more detailed explanation to bridge the gap between the hypothesis and the conclusion would be a valuable addition to the AMC - in particular how the reference studies are used.Such detailed explanation would provide a good example for the depth of substantiation that could expected from applicants.	Accepted	More detailed explanation of the use of the studies added. Rationale explained more.
Example #2: Parachute Recovery System (PRS) for sUAS.	14	190	Thurling Aero Consulting	This is a comment on the MDA in general and applies throughout the examples. In my experience as a TPTA for the ASTM F3322 standard, I have witnessed a large discrepancy between the MDA seen in hover versus the MDA calculated from all test points/ The latter is the method required in the current F3322. However, I would recommend that MDA be computed in the same manner as described in ASTM F3322, but that the test points from hover be computed separately from the test point in forward flight. This will allow the appropriate MDA to be calculated for the conditions.	Accepted	Minimum two tests now required. Hover + forward flight test for powered lift and max forward flight stable and in roll for fixed-wing.
Example #2: Parachute Recovery System (PRS) for sUAS.	14	199	DroneUp	This is a comment on the MDA in general and applies throughout the examples. In my experience as a TPTA for the ASTM F3322 standard, I have witnessed a large discrepancy between the MDA seen in hover versus the MDA calculated from all test points. The latter is the method required in the current F3322. However, I would recommend that MDA be computed in the same manner as described in ASTM F3322, but that an MDA from the test points in hover be computed separately from the test points in forward flight. This will allow the appropriate MDA to be calculated for the conditions.(repeat of 190)	Accepted	Minimum two tests now required. Hover + forward flight test for powered lift and max forward flight stable and in roll for fixed-wing.
Example #2: Parachute Recovery System (PRS) for sUAS.	14	55	DRONAVIA	I/ About "Compliance to 2.3.2"We suggest, based on our experience, to extend the number of tests in flight for determination of the descent rate and the minimum deployment altitude. At least 5 representative flight tests with a manual triggering device (MTD) linked with the FTS and 5 representative flight tests with automatic triggering (sensors integrated in the parachute for auto-deploy in case of UA failure).For the minimum deployment altitude, we suggest distinguishing it for manual (A) and automatic (B) triggering. Indeed, in case of problems on the UA, the operator reaction time must be taken into account in case of manual triggering. (A) For manual triggering, we suggest measuring total altitude traveled by the UA after 1 second delay + parachute activation for representing the operator reaction time. (1. FTS activation -> 2. One second delay -> 3. Parachute activation) (B) For automatic triggering, the measurement can be done with activating the FTS only and letting the parachute auto-deploy itself.The minimum deployment altitude should be the total distance traveled by the UA between the activation of the FTS and when the UA + parachute reach the stabilized descend rate.II/ We also suggest that an audible alarm be included in the parachute to warn people on the ground.	Partially accepted	Two tests now required for the example.
Example #2: Parachute Recovery System (PRS) for sUAS.	14	115	Farada Group	PRS does not require compliance with ASTM, then the operator is obliged to perform a combination: "worst case collision tests" (based on: Ranges of Injury Risk Associated with Impact from Unmanned Aircraft Systems https://doi.org/10.1007/s10439-017-1921-6) at a maximum impact speed of 10 m/s combined with the fact that a direct impact with the UA's center of gravity on a human head is highly unlikely (i.e., according to: ASSURE Ground Collision Severity Evaluation Phase II - Annex A page 113 https://www.assureuas.org/projects/uas-ground-collision-severityevaluation-2/) - a procedure complicated and requiring the operator to carry out 30 tests (one mandatory flight), almost on par with the ASTM standard and TPTA report, all expensive and difficult to implement. Further to meet the next criteria, it is necessary to predict a list of all faults according to ASTM F3309/F3309M-18 and predict the behavior of the UAV (required 30 test activations with one in the actual flight).	Aknowledged	Repeat of the collision testing referenced in the studies is not expected. Only showing evidence to the compliance to the 10m/s impact speed and mass limits to conform to the test parameters in the referenced studies.
Example #2: Parachute Recovery System (PRS) for sUAS.	14	181	Drone Alliance Europe	Definition of wind measurement at ground level is required. 1.8 m AGL liike an average person holding a wind measurement device in their hands?	Aknowledged	Delete reference to "on the ground" due to the confusion it causes. Any measurement is ok.
Example #2: Parachute Recovery System (PRS) for sUAS.	14	182	Drone Alliance Europe	Drone Alliance Europe would like to reiterate the comment made above, i.e. our proposal to reduce the number of representative activation tests from 30 to 20.	Noted	30 is considered more appropriate (it can be also linked with "rule of three" rationale)
Example #2: Parachute Recovery System (PRS) for sUAS.	14	178	Drone Alliance Europe	Wind speed limitation at ground level up to 8 m/s may be restrictive. Additional examples with combinations MTOW/wind speed/descent rate for wind speeds over 8 m/s are required.	Partially accepted	Combination speed vector 10m/s or below is the limiting factor from existing impact studies. Different descent rate and wind speed combination are allowed.
Example #3: Parachute Recovery System (PRS) for large UAS.	16	124	LBA	LBA comment "the last 30 test":Please explain, why only 30 tests in a row? if 27 fails I need to start again?No connection to 2.3.2LBA comment "arachute descent speed less or equal to 8 m/s":Why a diffenrent descent speed for larger UA ?	Aknowledged	30 succesful tests provide a 95% confidence for a achieving a 90% reliability after activation. Different descent speed is allowable for larger UAS since the risk reduction is achieved from a smaller critical area and not from a lethality reduction.
Example #3: Parachute Recovery System (PRS) for large UAS.	16	187	AIRBUS HELICOPTERS	With regard to the Page 17 - § 2.2.a) : "Demonstration by simulation should be limited to cases in which testing would be highly impracticable. Every simulation model should be validated by means of representative tests."COMMENT :What is the calculation / rationale behind this 3m value? Is this value the same for a descent with a parachute vs a ballistic descent?	Aknowledged	The 3m value is the length of a sideways drift under a deployed parachute while below the height of a person (1.8m). (heigth of a person / parachute descent speed) * wind speed = distance drifted sideways
Example #3: Parachute Recovery System (PRS) for large UAS.	16	56	DRONAVIA	I/ About "Compliance to 2.3.2"We suggest, based on our experience, to extend the number of tests in flight for determination of the descent rate and the minimum deployment altitude. At least 5 representative flight tests with a manual triggering device (MTD) linked with the FTS and 5 representative flight tests with automatic triggering (sensors integrated in the parachute for auto-deploy in case of UA failure).For the minimum deployment altitude, we suggest distinguishing it for manual (A) and automatic (B) triggering. Indeed, in case of problems on the UA, the operator reaction time must be taken into account in case of manual triggering. (A) For manual triggering, we suggest measuring total altitude traveled by the UA after 1 second delay + parachute activation for representing the operator reaction time. (1. FTS activation -> 2. One second delay -> 3. Parachute activation) (B) For automatic triggering, the measurement can be done with activating the FTS only and letting the parachute auto-deploy itself.The minimum deployment altitude should be the total distance traveled by the UA between the activation of the FTS and when the UA + parachute reach the stabilized descend rate.II/ We also suggest that an audible alarm be included in the parachute to warn people on the ground.	Partially accepted	Two tests now requred for the example and a buffer added for any PRS which is manually activated.

Example #3: Parachute Recovery System (PRS) for large UAS.	16	200	DroneUp	This is a comment on the MDA in general and applies throughout the examples. In my experience as a TPTA for the ASTM F3322 standard, I have witnessed a large discrepancy between the MDA seen in hover versus the MDA calculated from all test points. The latter is the method required in the current F3322. However, I would recommend that MDA be computed in the same manner as described in ASTM F3322, but that an MDA from the test points in hover be computed separately from the test points in forward flight. This will allow the appropriate MDA to be calculated for the conditions.(repeat of 191)	Accepted	Minimum two test now required. Hover + forward flight test for powered lift and max forward flight stable and in roll for fixed-wing.
Example #3: Parachute Recovery System (PRS) for large UAS.	16	191	Thurling Aero Consulting	This is a comment on the MDA in general and applies throughout the examples. In my experience as a TPTA for the ASTM F3322 standard, I have witnessed a large discrepancy between the MDA seen in hover versus the MDA calculated from all test points/ The latter is the method required in the current F3322. However, I would recommend that MDA be computed in the same manner as described in ASTM F3322, but that the test points from hover be computed separately from the test point in forward flight. This will allow the appropriate MDA to be calculated for the conditions.	Accepted	Minimum two test now required. Hover + forward flight test for powered lift and max forward flight stable and in roll for fixed-wing.
Example #4: UA maximum impact energy of less than 175 Joules (type 2)	18	44	Eric WALTER	Document page 19 / regarding the equation in section "Compliance to 2.2 – Evidence required for the conservative calculation"COMMENT:Within the frame of SORA, a SW has been / is being developed to assess the energy at impact (i.e. CasEx software - as per SORA 2.5 Annex F § A.3.6 and § E).A beta version is already available online.The AMC could instruct applicants to re-use this model.Alternatively, an applicant might still use her/his own model, provided adequate substantiation for the validity of the model is provided.	Aknowledged	Deliverable 2 will produce GM to answer intrinsic UAS characteristic critical area calculation in line with Annex F, while the M2 MoC addresses only active mitigation means to reduce the critical area.
Example #4: UA maximum impact energy of less than 175 Joules (type 2)	18	43	Eric WALTER	Document page 19 / regarding the equation in section "Compliance to 2.2 – Evidence required for the conservative calculation"COMMENT:In the equation, the Air Density factor is missing in the denominator (also see SORA 2.5 Annex F § A.3.6 Eq. 21 - public DRAFT).	Accepted	Equation fixed
Example #4: UA maximum impact energy of less than 175 Joules (type 2)	18	125	LBA	LBA comment "Example #4: UA maximum impact energy of less than 175 Joules (type 2"This will allow hover test of big drones !LBA comment to the point "Compliance to 2.2 – Evidence required for the drop tests":How to determine the value for low altitude flights? 20m ?	Rejected	This example is not connected to any flight test requirements.
Example #4: UA maximum impact energy of less than 175 Joules (type 2)	18	116	Farada Group	in this example, conduct a "drop test" over a minimum of 80m "free fall" vertically, record with a camera a minimum of 250 FPS to determine the limiting speed - this is to be done by the operator with his own resources? How do they imagine getting out of this test without crashing the drone? The use of a parachute to avoid crashing the drone, after all, changes the configuration of the UAV and thus changes the mitigation. How about restarting the engines? Or suddenly some sort of autorotation? :D And all this preferably without exceeding 120m AGL, i.e. at 40m above the ground after the drone is unleashed, it must somehow be rescued or crashed in the name of the test!	Aknowledged	UAS can be captured with a net or other impact reducing method. UAS manufacturers may drop test one drone to produce the necessary evidence for their customers to use in applications with similar drone models.
Example #4: UA maximum impact energy of less than 175 Joules (type 2)	18	201	DroneUp	"The speed of the UA to be considered to check that the impact KE threshold of 175 Joules is not exceeded should be either the terminal velocity or the maximum UA speed, whichever is higher. The formula to assess the KE is: KE = 0.5*(MTOM)*(Vterminal or Vmax)2."Comment: the formula at the end of this text ignores the wind speed which is often a very sizable contribution to kinetic energy. So, Vwind should be added to Vmax to establish a worst case groundspeed, i.e. flying at Vmax with the wind. I think you could probably ignore wind effects for the ballistic case but it should be added (vector sum) if the Vterminal was low.(repeat of 194)	Rejected	UAS crash directions are a random distribution with other directions having higher speeds and others having slower speed in aggregate all crashes averaged the windspeed is eliminated from impact speed.
Example #4: UA maximum impact energy of less than 175 Joules (type 2)	18	145	Board Member	the formula for Vterminal is missing the air density in the denominator	Accepted	Equation fixed
Example #4: UA maximum impact energy of less than 175 Joules (type 2)	18	183	Drone Alliance Europe	Formula for V terminal is not consistent on the units (some density magnitude is missing).	Accepted	Equation fixed
Example #4: UA maximum impact energy of less than 175 Joules (type 2)	18	194	Thurling Aero Consulting	"The speed of the UA to be considered to check that the impact KE threshold of 175 Joules is not exceeded should be either the terminal velocity or the maximum UA speed, whichever is higher. The formula to assess the KE is: KE = 0.5*(MTOM)*(Vterminal or Vmax)2."Comment: the formula at the end of this text ignores the wind speed which is often a very sizable contribution to kinetic energy. So, Vwind should be added to Vmax to establish a worst case groundspeed, i.e. flying at Vmax with the wind. I think you could probably ignore wind effects for the ballistic case but it should be added (vector sum) if the Vterminal was low.	Rejected	UAS crash directions are a random distribution with other direction having higher speeds and others having slower speed in aggregate all crashes averaged the windspeed is eliminated from impact speed.