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1	*Charles Luffman - Luffships*	header	1	This is a response to the published document here providing relevant information and revisions as given in the following comment fields by Charles R Luffman, an independent aircraft engineer (retired) with significant airship development knowledge and experience, to consider concerning the proposed EASA CRI Consultation paper entitled Special Condition SC Gas for large airships (issue 1) dated 11 Feb 2021.		yes	no	noted	-
2	*Charles Luffman - Luffships*	Explanatory note	4	EASA has received applications for the type certification of large airships while ithas not published Certification Specifications (CS) for these products. Three draft CS2 had been made available to EASA by National Aviation Authorities from work performed in 2003.The drafts are entirely based on Airworthiness Requirements which have been legally effective3 in some EASA Member States before.	Clumsy wording! Please change to: ".... large airships but has not not published Certification Specifications (CSs) for them before. Three draft ...."	yes	no	accepted	Wording has been amended.
3	*Charles Luffman - Luffships*	Explanatory note	4	EASA has received applications for the type certification of large airships while ithas not published Certification Specifications (CS) for these products. Three draft CS2 had been made available to EASA by National Aviation Authorities from work performed in 2003.The drafts are entirely based on Airworthiness Requirements which have been legally effective3 in some EASA Member States before.	Singular or plural and clumsy text? Please change as follows: "Three draft CSs previously were made available ...."	yes	no	partially-accepted	Wording has been amended to the following: "Three draft CS's[2] are available in the EASA inventory, based on codes used by National Aviation Authorities prior to September 2003."
4	*Charles Luffman - Luffships*	Explanatory note	4	EASA has received applications for the type certification of large airships while ithas not published Certification Specifications (CS) for these products. Three draft CS2 had been made available to EASA by National Aviation Authorities from work performed in 2003.The drafts are entirely based on Airworthiness Requirements which have been legally effective[3] in some EASA Member States before.	Clumsy wording! Please change as follows: ".... 2003. The drafts were based on legally effective Airworthiness Requirements in some ...."	yes	no	partially-accepted	Sentence deleted, see EASA response to comment #3
5	*Charles Luffman - Luffships*	Explanatory note	4	In the absence of agreed and published certification specifications for this type of products, and pursuant to points 21.B.75 and 21.B.80 of Part-21, a complete set of dedicated technical specifications in the form of a Special Condition for Gas Airships has been developed. This Special Condition addresses the unique characteristics of these products and defines airworthiness specifications that may be used to demonstrate compliance with the essential requirements in Annex II of regulation (EU) 2018/1139 of the European Parliament and Council. This is required for the issuance of the type certificate, as well as the approval of changes to the type certificate.	Clumsy wording! Please change to: ".... specifications for such aircraft, and ...."	yes	no	partially-accepted	Sentence changed to "In the absence of published certification specifications for airships by EASA, and

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6	*Charles Luffman - Luffships*	Explanatory note	4	In the absence of agreed and published certification specifications for this type of products, and pursuant to points 21.B.75 and 21.B.80 of Part-21, a complete set of dedicated technical specifications in the form of a Special Condition for Gas Airships has been developed. This Special Condition addresses the unique characteristics of these products and defines airworthiness specifications that may be used to demonstrate compliance with the essential requirements in Annex II of regulation (EU) 2018/1139 of the European Parliament and Council. This is required for the issuance of the type certificate, as well as the approval of changes to the type certificate.	One presumes the term Gas Airships is used to distinguish them from Hot Air types. However, it would be better to refer to them as Lighter-than-air (LTA) Gas Inflated Airships because: 1) Airships filled with carbon dioxide, which is a gas, wouldn't float due to the gas not being LTA and 2) Airships can be developed to transport other gases (not necessarily LTA) in a similar way to ships, as tankers, which is not what this SC is about. PLease note that it is only the gas used for inflation purposes that is LTA, not the airship. Nonetheless, the LTA-gas still has weight that contributes to airship weight that needs to be taken account of, which this SC doesn't yet make clear. Further comments below deal with this missing aspect.	yes	no	noted	Further consideration deferred.
7	*Charles Luffman - Luffships*	Explanatory note	4	In the absence of agreed and published certification specifications for this type of products, and pursuant to points 21.B.75 and 21.B.80 of Part-21, a complete set of dedicated technical specifications in the form of a Special Condition for Gas Airships has been developed. This Special Condition addresses the unique characteristics of these products and defines airworthiness specifications that may be used to demonstrate compliance with the essential requirements in Annex II of regulation (EU) 2018/1139 of the European Parliament and Council. This is required for the issuance of the type certificate, as well as the approval of changes to the type certificate.	This SC is for particular aircraft types. Please recognise this fact and change the SC as follows: ".... characteristics of these aircraft and ...."	yes	no	partially-accepted	Sentence changed to “This Special Condition addresses the unique characteristics of airships and defines airworthiness specifications…”
8	*Charles Luffman - Luffships*	Explanatory note	4	The proposed Special Condition is a high-level set of performance-based requirements. It was developed in close cooperation with an industry working group. The Special Condition addresses two designs, one being a 260 000 m3 rigid equilibrium airship for cargo operations, the other a 45 000 m3 non-rigid hybrid airship for up to 55 passengers. However, the authors believe it is applicable to all manned airships with non-pressurized crew or passenger compartments. It is subject to EASA Certification Team agreement that the Special Condition is sufficient as a Certification Basis, for example unmanned designs are not sufficiently addressed by this proposal. Due to the low number of projects no categories have been established. The different safety levels for each specific airship design will be addressed through the Means of Compliance (MOC).	Please change as follows: ".... rigid near equilibrium airship ....". Please also note that while airships can operate in equilibrium between weight and buoyancy, they generally don't, where traditional types normally operated within a +/_ range of 10%. This fact subsequently brings into question the term 'hybrid', dealt with in the following comment.	yes	no	not accepted	“Equilibrium Airships” is a commonly used expression in industry.

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9	*Charles Luffman - Luffships*	Explanatory note	4	The proposed Special Condition is a high-level set of performance-based requirements. It was developed in close cooperation with an industry working group. The Special Condition addresses two designs, one being a 260 000 m3 rigid equilibrium airship for cargo operations, the other a 45 000 m3 non-rigid hybrid airship for up to 55 passengers. However, the authors believe it is applicable to all manned airships with non-pressurized crew or passenger compartments. It is subject to EASA Certification Team agreement that the Special Condition is sufficient as a Certification Basis, for example unmanned designs are not sufficiently addressed by this proposal. Due to the low number of projects no categories have been established. The different safety levels for each specific airship design will be addressed through the Means of Compliance (MOC).	It should be noted that all aircraft displace the atmosphere to some extent, so are buoyed by it under Archimedes' principle, and use aerodynamic methods to an extent necessary for sufficient lift to remain airborne. Also, the term 'hybrid' is used broadly by numerous commercial enterprises (not necessarily aircraft developers) e.g. hybrid cars using a combination of fuel and electric energy. It thus is not a good term for airships. On a scale from 0 to 100%, aircraft that make no attempt to better use buoyancy (ignoring it) are near 0% buoyant aircraft. Some developers have flown aircraft with inflatable wing/body structures that can be flown while inflated fully with cold air (so flooded) but with the possibility of using an LTA-gas instead to reduce the airborne weight. These thus are 0 to say 30% buoyant aircraft. One developer arranged his design as 30 to 70% type, so was a mid-range buoyant aircraft. The developer referenced by the SC developed a wide-bodied type in the range 60 to 100% that can fly in equilibrium, so is a substantially buoyant aircraft type. However, the other developer referenced is following a traditional airship design approach that generally will operate in the 90 to 110% buoyancy range - so also needs to develop negative aerodynamic lift and/or use vertical down thrust to counter excess buoyancy.	yes	no	noted	“Hybrid Airships” is a commonly used expression in industry.
10	*Charles Luffman - Luffships*	Explanatory note	4	The proposed Special Condition is a high-level set of performance-based requirements. It was developed in close cooperation with an industry working group. The Special Condition addresses two designs, one being a 260 000 m3 rigid equilibrium airship for cargo operations, the other a 45 000 m3 non-rigid hybrid airship for up to 55 passengers. However, the authors believe it is applicable to all manned airships with non-pressurized crew or passenger compartments. It is subject to EASA Certification Team agreement that the Special Condition is sufficient as a Certification Basis, for example unmanned designs are not sufficiently addressed by this proposal. Due to the low number of projects no categories have been established. The different safety levels for each specific airship design will be addressed through the Means of Compliance (MOC).	Please change as follows: ".... non-rigid substantially buoyant aircraft for up to ....". Please note that substantially buoyant aircraft may still be classified as airships. However, this may not be appropriate for mid or lower range buoyant aircraft types that cannot fly in equilibrium, always needing aerodynamic lift to remain airborne. It should be further noted that the substantially buoyant aircraft (so called hybrid) referenced herein can fly in equilibrium, depending on the weight of ballast, fuel, payload and other disposable loads carried.	yes	no	not accepted	“Hybrid Airships” is a commonly used expression in industry.

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11	*Charles Luffman - Luffships*	Explanatory note	4	Due to the differences between the two projects (rigid equilibrium airship vs. non-rigid hybrid airship), EASA intends to develop in cooperation with the applicant specific Means of Compliance for each individual project. Once Means of Compliances are agreed EASA intends to make them available for public consultation. The legacy codes TAR, LBA LFLS, FAA-P-8110-2 ADC, CAP 471 BCAR Section Q, and the EASA drafts of CS-30T and CS-30N, as well as industry standards, may be considered Means of Compliance subject to agreement with the specific EASA Certification Team.	See comment above concerning the two airship types referenced. Any of the types mentioned in the comments above can be developed for serious purposes at large sizes (Transport Category), so should be covered by the new CS if their behaviour primarily is as for airships. These mainly are unidirectional types. However, EASA also should take note that equivalent rules also will be needed soon, if not included in this CS, for omni-directional airships such as those being developed in Russia and by Luffships Ltd, who have designs for Transport Category types. The author of these comments is Luffships Ltd's director. He has significant experience in the development of both traditional and new omni-directional types. Indeed, he has experience from using all of the legacy codes mentioned and from working with the the various airworthiness authorities to show compliance as applicable for numerous airship and balloon developments he enabled.	yes	no	noted	EASA is generally open to develop applicable Means of Compliances in cooperation with applicants for other airship design concepts.
12	*Charles Luffman - Luffships*	Explanatory note	4	Ancillary ground equipment was a controversial discussion between EASA and the industry group. The final position is reflected in SC-GAS 2380. The main objective is to prevent unintended free flight and to protect people on the ground as well as crew on board. The ancillary ground equipment itself will not be covered by the Type Certificate, however the interface to moor the airship to the ground will be covered by the Type Certificate. Required performance, design requirements and procedures to assure the safe mooring of the airship must be established.	Accidents with both airships moored and being handled at ground level are one of the greatest problems for developers to solve - more so than airships underway. It thus is good that EASA has a position on this, which Luffships Ltd would like to know more about and be involved with formulation of suitable requirements.	yes	no	noted	EASA is generally open to develop applicable Means of Compliances for ancillary ground equipment and handling in cooperation with applicants.
13	*Charles Luffman - Luffships*	SC GAS.2000	6	This specification prescribes airworthiness specifications for the issuance of type certificates, and changes to those certificates, for gas airships.	Please change as follows: "...., for large airships filled with LTA-gas."	yes	no	not accepted	See EASA response to comments #6. Further consideration deferred.
14	*Charles Luffman - Luffships*	SC GAS.2000 (a)	6	Singular/plural issue. For the purposes of this Special Condition, the following definition applies:	Please change as follows: "...., the following definitions apply:"	yes	no	accepted	Wording amended.
15	*Charles Luffman - Luffships*	SC GAS.2000 (2)	6	Flight phases means take-off or unmasting, en route, approach, landing or masting and	Please note, 'take-off' is an inappropriate term for airships, which (like ships) instead are launched. Omni-directional (O-D) airships also will have different mooring arrangements that fixes them (like ships at their birth) and don't need or use a mast - so won't unmast when launched. Even so, the act of launching for any airship (as for ships) involves release of restraint lines from their anchor positions (which may be at the top of a mast) and safe stowage in a way that guarantees use when next captured.	yes	no	noted	Hybrid airships with a running take-off and landing are considered in this definition. Other design concepts are covered by masting and unmasting.
16	*Charles Luffman - Luffships*	SC GAS.2000 (2)	6	Flight phases means take-off or unmasting, en route, approach, landing or masting and	Airships, particularly those in a substantially buoyant condition, don't land - instead remaining airborne. Landing (i.e. becoming ground-borne) thus also is an inappropriate term, which should be replaced with the term 'capture'. Masting then depends on the ground arrangements to hold the airship safely, which doesn't necessarily require a mast.	yes	no	noted	See EASA response comment #15

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17	*Charles Luffman - Luffships*	SC GAS.2000 (2)	6	safe transition to the balked-landing conditions	Because LTA-gas filled airships don't normally land, where they would have to cease being primarily airborne (both aerostatically and aerodynamically) so that their weight then becomes essentially ground-borne, means that safe transition to abort the capture process is much easier for airships than for aeroplanes trying to balk their landing phase - particularly after touch down. The processes involved to end flight for airships types therefore is different to aeroplanes and needs different terminology to avoid confusion. It thus would be better to say, "safe transition to continuing flight conditions after aborting capture".	yes	no	not accepted	The term balked landing is widely used by industry. Balked landing is not related to the capture or masting of the airship.
18	*Charles Luffman - Luffships*	SC GAS.2000 (2)	6	safe transition to the balked-landing conditions	The term 'balked-landing' also is inappropriate and should be replaced with 'aborted-capture'. In summary, please change the definition as follows: "Flight phases means/involves: launch and release into free controlled flight, en route flight, approach to ground, capture, and safe transition to continuing flight after aborting capture, or any phase based on the intended operation such as pseudo-hover over a ground position."	yes	no	not accepted	See EASA response comment #17
19	*Charles Luffman - Luffships*	SC GAS.2000 (3)	6	Airship is a power-driven lighter-than-air aircraft.	Please change to: "Airship is a power-driven dirigible substantially-buoyant aircraft able to float in air." Note: An essential criteria for airships since their conception was the ability to be controlled/steerable i.e. dirigible.	yes	no	not accepted	The definition was taken over from ICAO Annex I.
20	*Charles Luffman - Luffships*	SC GAS.2000 (4)	6	Ancillary equipment is considered the mooring mast and any ground equipment supporting safe operation.	Please change to: Ancillary equipment is considered to be the ground facilities and equipment supporting safe operation.	yes	no	partially-accepted	Ancillary equipment is considered to be any ground equipment (e.g. mooring mast) supporting safe operation.
21	*Charles Luffman - Luffships*	SC GAS.2000 (5)	6	Static heaviness means the difference between airship mass and static lift, downwards positive and upwards will be negative	Note: mass is a quantity, but lift is a force, so this definition is nonsense! Please change to: "... between airship all-up weight and aerostatic lift (i.e. buoyancy), downwards positive. Upwards thus is negative or may be treated as positive aerostatic lightness."	yes	no	noted	Considering the physical laws the definition is indeed incorrect, however, the wording is commonly used by industry and adopted from the TAR.

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22	*Charles Luffman - Luffships*	SC GAS.2000 (6)	6	'Continued safe flight and landing' means that the airship is capable of continued controlled flight and landing, possibly using emergency procedures, without requiring exceptional pilot skill or strength. Upon landing, the airship and the procedures must reasonably mitigate risks of injuries for occupants while the airship may be damaged including hull loss which may be caused by deliberate actions.	Please replace the word 'landing' (3 times) with 'capture or grounding'. Also, the term 'hull' needs to be replaced with 'aerostat'. Please note, capture is the normal term for terminating flight at a ground base. However, there also are other situations both normal and emergency when capture may not be appropriate, but where the airship needs to be grounded and possibly landed - when lift is substantially destroyed to prevent further flight. Please also note: the term hull has often been used by airship developers to describe (as for ships) the outer shell or surface of the vessel displacing the fluid substance (the atmosphere for airships) it floats in and providing a smooth form for the fluid to flow around it. For airships, the vessel for this is its aerostat, which may be constructed in different ways. Rigid airships traditionally were constructed with a light skinned aerostat framework containing thin membrane balloon cells without pressurisation containing LTA-gas. The outer skin of such airships, while providing smoothness for airflow streamlining purposes however was air-porous, so not an LTA-gas container. It is the membrane of the balloon cells that thus both contains the LTA-gas and displaces the air for buoyancy in the atmosphere. Its hull (the outer skin) thus can be damaged/lost to some extent without loss of buoyancy. Non-rigid airships on the other hand use an aerostat that is constructed in such a way that its outer skin (the envelope) is the gas container and the main part enabling aerodynamic flow around it. However, the envelope on its own would not function as a structure to maintain form without the other aerostat parts, which includes means for pressure stabilisation and the LTA-gas to puff it out, which like any other airship part needs its weight to be minimised in order for the airship to float. In both cases (rigid or non-rigid) it is the aerostat that is the critical airship part that must be able to function both aerodynamically and aerostatically for safe flight to continue , despite damage. Even so, it is unreasonable to include aerostat loss during flight in this requirement, just as EASA does not expect aeroplanes to land safely after losing their wings. However, one accepts that after grounding under emergency conditions the aerostat may be lost, which can be a good thing to destroy aerostatic lift, thus preventing further flight while people escape.	yes	no	noted	Further consideration deferred. This definition addresses a change in the definition of "Continued Safe Flight and Landing, CSFL", which is an established term commonly used by industry and other Certification Specifications. EASA is fully aware that the proposed Special Conditiion deviates from established airship terminology in order to meet industry common practices.
23	*Charles Luffman - Luffships*	SC GAS.2000 (7i)	6	VH is the maximum speed obtainable in level flight.	Please use 'airspeed' instead of just 'speed'! Otherwise it may be taken to include the effects of a tail wind resulting in greater speed.	yes	no	accepted	Wording amended

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24	*Charles Luffman - Luffships*	SC GAS.2000 (7ii)	6	The maximum airspeed obtainable in a climb with all forward thrust engines at maximum take-off power and the airship in the minimum drag configuration and with minimum approved static heaviness (or maximum approved static lightness), or	aerostatic instead of static	yes	no	not accepted	Static heaviness is a commonly used term in industry.
25	*Charles Luffman - Luffships*	SC GAS.2000 (7ii)	6	The maximum airspeed obtainable in a dive with all engines at maximum continuous power and the airship in the minimum drag configuration and with maximum approved static heaviness.	aerostatic instead of static	yes	no	not accepted	See EASA response comment #24.
26	*Charles Luffman - Luffships*	SC GAS.2000 (8)	6	Masses relevant to the design of the airship will be defined in the associated MoC.	Please add: "See SC GAS.2010." This is needed as MoC was not defined before.	yes	no	not accepted	Reference to SC GAS.2010 is self evident.
27	*Charles Luffman - Luffships*	SC GAS.2000 (9)	6	Static lift or Buoyancy is the difference between the weight of air displaced by the airship and the weight of the lifting gas.	Aerostatic instead of Static	yes	no	not accepted	See EASA response comment #24.
28	*Charles Luffman - Luffships*	SC GAS.2000 (9)	6	Static lift or Buoyancy is the difference between the weight of air displaced by the airship and the weight of the lifting gas.	This definition is not consistent with physics, showing lack of understanding of basic scientific principles; where buoyancy in the atmosphere on aircraft does not arise in a different way to buoyancy applied on marine craft from water. This arises from a misconception of the purpose of LTA gases, which are to inflate (puff out) and stabilise the airship's gas cells or its aerostats' envelope - nothing more. In that respect such gases are structural components essential to maintenance of form and function. The LTA gases used thus are not lifting substances, which would be magic if they were, where buoyancy instead is an externally applied force from the atmosphere. Please change the definition to: "Aerostatic lift or Buoyancy is equivalent to the weight of air displaced by the airship." If one discounts the volume of all of the airship's parts and systems, except the LTA gas (generally acceptable), then the displacement is equal to the volume of the LTA-gas contained in the airship's aerostat - enabling an approximate method to calculate buoyancy. However, the weight of the LTA gas or gases used, which is/are significant, then must be added to the all-up weights table for the airship. This is a good thing to do because the effect of its mass/inertia then would not be left out of important airship dynamic behaviour calculations.	yes	no	accepted	Wording amended, "Aerostatic lift or Buoyancy is equivalent to the weight of air displaced by the airship."
29	*Charles Luffman - Luffships*	SC GAS.2000 (10)	6	Mooring means ground handling considered in flight until tying an airship to the ground. Flight and ground crew is typically required to perform the operation	This is a messy and confused definition. Please change to: "Mooring means the ground actions necessary to capture an airship and restrain it sufficiently for following activities, including parking. Both flight and ground crew typically are required for the purpose."	yes	no	accepted	Wording amended, Mooring means ground handling considered in flight until securing an Airship to the ground. Flight and ground crew is typically required to perform the operation

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30	*Charles Luffman - Luffships*	SC GAS.2000 (11i)	6	i. Static heaviness or lightness;	Aerostatic instead of Static	yes	no	not accepted	See EASA response comment #24.
31	*Charles Luffman - Luffships*	SC GAS.2000 (11iii)	6	iii. Mass	Please change to: "Mass or weight, as appropriate". Note: weight (as a force) should be the normal term used unless it is for dynamic calculation purposes needing the quantity of substance (matter or material) involved. Units to use for mass are kilograms (kg). However, weight either may use absolute units (Newtons - N) or relative units (kilogram force - kgf).	yes	no	not accepted	The definition refers to the configuration of the airship, where mass is considered appropriate.
32	*Charles Luffman - Luffships*	SC GAS.2000 (11vi)	7	vi. Undercarriage	It would be better to use the term 'Ground-fender' for airships instead of 'undercarriage' because of the different way they act and are used compared with aeroplane and helicopter undercarriages, where they generally are not used to support the airship's all-up weight or with steering to follow a runway.	yes	no	partially-accepted	Undercarriage replaced by landing gear, a term well known in aviation.
33	*Charles Luffman - Luffships*	SC GAS.2000 (11vii)	7	vii. Thrust unit(s) tilt or vector	Please change to: "Thrust unit(s) fixed attitude, tilt or vector"	yes	no	partially-accepted	Wording amended to “Thrust unit(s), tilt or vector”
34	*Charles Luffman - Luffships*	SC GAS.2100	8	**Mass and Centre of Gravity**	It appears that EASA has an odd idea concerning use of the term 'mass' instead of 'weight', causing confusion. However, to determine the mass of an item people generally weigh it and then establish its mass from calculation using a standard value for gravity, which varies around the world. Naturally, one does need to know the mass and associated inertia values for various dynamic calculations, but in the end it is the resulting applied forces they need to determine in order to design parts able to sustain them safely. Mass is not a force, but weight is and it is the weight of the airship that must be balanced against buoyancy for flotation in equilibrium.	yes	no	noted	
35	*Charles Luffman - Luffships*	SC GAS.2100	8	**Mass and Centre of Gravity**	PLease change to: "Weight, Buoyancy and their Centroids" It should be noted that weight and buoyancy both result from the effects of gravity, so are related and affect flight in similar but opposite in direction ways.	yes	no	not accepted	It is common practice to work with masses and SI units.
36	*Charles Luffman - Luffships*	SC GAS.2100 (a)	8	Limits for mass, heaviness and centre of gravity that provide for the safe operation of the airship are to be determined.	Please change to: "Limits for weight, heaviness/lightness, centre of gravity and centre of buoyancy that ..."	yes	no	not accepted	See EASA response comment #35

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37	*Charles Luffman - Luffships*	SC GAS.2100 (b)	8	The design must comply with each airworthiness specification of this subpart at critical combinations of mass, heaviness, envelope, ballonet and gas cell pressure and centre of gravity within the airship's range of loading conditions using acceptable tolerances.	The terms envelope and ballonet are particular to non-rigid and some semi-rigid airships and the requirement is written in a confusing way where intent is not clear. They are important airship features and gas cell pressure is an important issue for some airships, but these things do not appear to be relevant in this requirements section, where they are structural aspects that should be addressed latter. What's missing and needed in this section is the way buoyancy and its centroid may change, which affect flight control. Please amend as follows: ".... combinations of weight, heaviness/lightness, virtual (added) mass effects, centre of buoyancy and centre of gravity within ..." Please note, 'added mass' effects from the atmosphere generally are small (negligible) for aeroplanes. However, the effects are significant for airships due to their aerostat's large size and does affect resulting flight and grounding loads applied.	yes	no	partially-accepted	Wording amended to "The design must comply with each airworthiness specification of this subpart at critical combinations of of the airship configuration parameters using acceptable tolerances."
38	*Charles Luffman - Luffships*	SC GAS.2100 (c)	8	The condition of the airship at the time of determining its empty mass and centre of gravity must be defined and repeatable.	Please change to: ".... determining empty weight and ...."	yes	no	not accepted	See EASA response comment #35
39	*Charles Luffman - Luffships*	SC GAS.2100 (d)	8	At any time, the flight crew must have means to determine, with sufficient accuracy to control the airship, the static heaviness of the airship.	Please change to: ".... the aerostatic heaviness/lightness of the airship."	yes	no	not accepted	Static heaviness is defined in SC GAS.2000(a)(5)
40	*Charles Luffman - Luffships*	SC GAS.2103 (b)	8	The determination of the flight envelope must account for the most adverse conditions for each flight configuration.	Determination of	yes	no	accepted	Wording amended to "Determination of the flight envelope ...."
41	*Charles Luffman - Luffships*	SC GAS.2105 (a)(1)	8	still air and ambient atmospheric conditions within the operating envelope	Still air	yes	no	accepted	Wording amended, typo corrected.
42	*Charles Luffman - Luffships*	SC GAS.2105 (b)	8	Unless otherwise prescribed, the applicant must develop the performance data required by this subpart	...., the applicant must develop performance data	yes	no	accepted	Wording amended
43	*Charles Luffman - Luffships*	SC GAS.2105 (b)(2)	8	Atmospheric conditions above and below standard atmosphere that are within the range of operating limitations should be taken into account.	'should be' indicates an optional requirement that the applicant does not have to comply with - making it superfluous. It also changes (so confuses) the intent of (b), which says "the applicant must develop ....". The last phrase, "should be taken into account" thus needs to be deleted (preferable) or changed to reflect intent.	yes	no	accepted	Wording amended, "operating limitations must be taken into account."
44	*Charles Luffman - Luffships*	SC GAS.2105 (c)(1)	8	correspond to the vectored, propulsive thrust available under the particular ambient atmospheric conditions and the particular flight condition specified in subparagraph ( )	subparagraph (?)	yes	no	accepted	Wording amended, "subparagraph (a)"
45	*Charles Luffman - Luffships*	SC GAS.2105 (c)(2)	8	account for losses due to installation , power or equivalent thrust absorbed by the accessories and services , cooling needs, and other demands on power source	installation(s) ? Also, what are or is the installation ?	yes	no	not accepted	Installation losses is a common term used in industry.

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46	*Charles Luffman - Luffships*	SC GAS.2105 (d)	8	The applicant must select the procedures for all flight phases, including critical-loss of thrust procedures and related configurations and changes of configuration. The procedures must be established for all applicable conditions and configurations;	configurations.	yes	no	partially-accepted	Wording amended, "The applicant must select the procedures for all flight phases, including critical loss-of-thrust procedures and related configurations and change to configuration. The procedures must be established for all applicable conditions and configurations;"
47	*Charles Luffman - Luffships*	SC GAS.2105 (e)	9	The procedures used for determining performance must be executable consistently by flight crew of average skill in atmospheric conditions expected to be encountered in service.	to determine	yes	no	accepted	Wording amended accordingly "The procedures used to determine performance must be executable consistently by flight crew of average skill in atmospheric conditions expected to be encountered in service."
48	*Charles Luffman - Luffships*	SC GAS.2105 (f)	9	Performance data determined in accordance with paragraph (b) of this section must account for losses due to atmospheric conditions, the operation and the installation.	what is "the installation "? Also, is (b) the correct reference?	yes	no	noted	EASA text is intentional as written. The reference is correct.
49	*Charles Luffman - Luffships*	SC GAS.2105 (g)	9	Procedures and performance information of the airship at various levels of turbulence must be established for combinations of mass and static heaviness and be incorporated in the AFM.	AFM needs a definition.	yes	no	partially-accepted	Wording amended to read "Airship Flight Manual."
50	*Charles Luffman - Luffships*	SC GAS.2110	9	**Minimum Steady Flight Speed**	Is this ground speed or airspeed?	yes	no	not accepted	Flight velocities are always airspeed
51	*Charles Luffman - Luffships*	SC GAS.2110 (c)	9	Stall Speed determination (see SC GAS.2111)	Why is this important for near equilibrium airships?	yes	no	noted	Please note that this code satisfies different airship design concepts, a requirement may be "not applicable (N/A)" for a specific design.
52	*Charles Luffman - Luffships*	SC GAS.2111	9	Stall Speed determination (see SC GAS.2111)	The following SC GAS requirements (2111, 2112, 2113 and 2115) appear to be an overcautious imposition on applicants that needs justification for substantially buoyant aircraft able to float in equilibrium that, unlike aeroplanes, have several mitigating circumstances should stall occur.	yes	no	noted	See EASA response comment #51
53	*Charles Luffman - Luffships*	SC GAS.2111	9	**Stall Demonstration**	Why is this important for near equilibrium airships able to float?	yes	no	noted	See EASA response comment #51
54	*Charles Luffman - Luffships*	SC GAS.2112	9	**Stall characteristics**	Why is this important for near equilibrium airships?	yes	no	noted	See EASA response comment #51
55	*Charles Luffman - Luffships*	SC GAS.2113	9	**Stall Warning**	Why is this important for near equilibrium airships?	yes	no	noted	See EASA response comment #51
56	*Charles Luffman - Luffships*	SC GAS.2115	10	**Take-off Performance**	Please change to: "Launch Performance"	yes	no	not accepted	Take-off is a standing term in the industry.
57	*Charles Luffman - Luffships*	SC GAS.2115 (a)	10	The applicant must determine airship take-off performance accounting for:	Please change to ".... airship launch performance ...."	yes	no	not accepted	See EASA response comment #56
58	*Charles Luffman - Luffships*	SC GAS.2115 (a)(1)	10	stall speed safety margins;	Why is this requirement imposed?	yes	no	noted	See EASA response comment #51

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59	*Charles Luffman - Luffships*	SC GAS.2115 (a)(2)	10	minimum control speeds;	Large airships for 21st Century purposes are being designed for control with zero airspeed (when stall is not an issue) and vertical ascent via thrust and/or induced lift, although they also will be able to launch with airspeed enabling aerodynamic lift to overcome aerostatic heaviness. Some designs also will use aerostatic lightness to ascend (as gas balloons do) and use weight control methods, as submarines do, to dive or ascend. Some people call this 'buoyancy control', but that is a fallacy because buoyancy is an externally applied force from the atmosphere that cannot be directly controlled. However, it is possible to control airship weight directly.	yes	no	noted	Please note the code was proposed based on the experience with a recent airship incident due to stall.
60	*Charles Luffman - Luffships*	SC GAS.2115 (a)(4)	10	the volume required to clear obstacles by a 15 m (50-ft) margin must be determined.	What is meant by "the volume required ..."? The volume of what? Not defined before! Also, why is this important?	yes	no	partially-accepted	Wording amended, volume replaced by airspace.
61	*Charles Luffman - Luffships*	SC GAS.2115 (a)(5)	10		(5) Weather and environment, such as turbulence, launch height above sea level, temperature and so forth that affect flight behaviour and ability.	yes	no	not accepted	Requirement addressed by 2105(b)
62	*Charles Luffman - Luffships*	SC GAS.2120 (b)	10	The maximum rates of climb and descent, to be used for all operations, must be established for all conditions using maximum continuous forward thrust.	This may be what aeroplanes and some old airships needed, but is not appropriate for new large types with vertical thrust and means for weight control, which likely will be the new ways. It's enough to say "The maximum rates of climb and descent, to be used for all operations, must be established for all conditions." The rest of the requirement (i.e. "using maximum continuous forward thrust") doesn't reduce intent of the requirement, but its deletion removes an inappropriate constraint - thus broadening the requirement.	yes	no	partially-accepted	The objective of this para is to demonstrate that the ballonet and gas cell management is sufficiently designed to cope with max. cont. thrust. Wording amended.
63	*Charles Luffman - Luffships*	SC GAS.2122 (a)	10	The airship must be capable of maintaining level flight and zero rate of descent following failure of one or more critical engine(s).	Level flight implies "zero rate of descent", so doesn't need a secondary superfluous expression for clarification, which should be deleted. It should be born in mind that prior to power failure the airship may have been flying aerostatically light, when it then may climb instead of descend. However, while previously overlooked, there is no need to additionally say that there should be zero rate of climb, as this also is implied. The requirement thus may be given as follows: "The airship must be capable of maintaining level flight following failure of one or more critical engine(s)."	yes	no	partially-accepted	Wording amended to “The Airship must be capable of maintaining level flight, and zero rate of descent below V_{mc}, following failure of one or more critical engine(s).”

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64	*Charles Luffman - Luffships*	SC GAS.2122 (b)	10	in case of critical loss of thrust, Enroute Flight Path information must be provided to crew. Variations of mass due to fuel consumption, snow and rain accumulations need to be computed	Provided to flight crew or ground crew or both? What is the intent of this requirement? It appears to be a need to alert people so that they can prepare and be ready to support safe capture wherever that eventually may be. However power failure would be obvious to flight crew. Also, why are these requirements consistently referring to mass when weight is the issue affecting continuing flight. Change is suggested as follows: ".... of thrust. estimated en route Flight Path information must be provided to ground crew. Variations of weight due to fuel consumption, snow and rain accumulations also shall be determined.	yes	no	partially-accepted	Wording amended, enroute flight path replaced by Net Flight Path. See EASA response comment #35
65	*Charles Luffman - Luffships*	SC GAS.2125 (a)	10	For airships intended to load and unload cargo or other ballast when the airship is in flight, hovering, or on the ground but not masted, performance data must be established with the airship in the most critical configuration.	Please change as follows: ".... cargo or other items and ballast when .... or against the ground but not captured, performance data ...."	yes	no	partially-accepted	Wording amended "Airships designed to be loaded or unloaded off the mast, performance data must be established with the airship in the most critical configuration."
66	*Charles Luffman - Luffships*	SC GAS.2130	10	**Landing Data**	Please change to "Capture and Grounding Data". This is needed because landing is an inappropriate term for aircraft that remain mainly afloat (so airborne) at ground level. Please also note, this terminology is used for marine craft and better suits airships.	yes	no	not accepted	Landing is a common used term in industry.
67	*Charles Luffman - Luffships*	SC GAS.2130	10	Wind within the operational limits:	Do the following data determination requirements (a, b, etc) belong with this wind limit or the previous operational limits? This is poorly expressed!	yes	no	not accepted	Comment is not clear, it is not clear which wind limit the commenter is referring to. EASA would agree further guidance through means of compliance supplementing the requirement for a specific project.
68	*Charles Luffman - Luffships*	SC GAS.2130 (a)	10	The airspace volume, required to approach, land and stop, starting from a height of 15 m (50 ft) above the landing surface.	"airspace volume" either needs prior definition or substitution with comprehensible wording. The following change is suggested: "The airspace size required to approach and securely capture the airship, ending free flight, starting from 15 m (50 ft) above the capture site surface." Please note that for a traditional airship using a mobile mast it would first be captured at a safe mid-field position and then, when locked onto the mast (so captured), moved to a secure site for further activity or into a hangar for protection. Luffships Ltd plans to launch and capture its omni-directional types vertically directly at the secure operator's site without using a mast and without putting it in a hangar, instead providing protection at that site.	yes	no	partially-accepted	Wording amended, airspace volume replaced by airspace.
69	*Charles Luffman - Luffships*	SC GAS.2130 (b)	11	Performance data must be established for each scheduled technique with the airship in the most critical configuration for landing.	Replace the last word "landing" with "capture and/or grounding".	yes	no	not accepted	See EASA response comment #66.
70	*Charles Luffman - Luffships*	SC GAS.2130 (c)	11	The airspace volume after a critical loss of thrust on multi-engine airships must be published if different than with all engines operating.	Please change the first part to: "The airspace size after ....). The second part is confusing, needing clarification. Is this to do with propeller failure, power failure or what?	yes	no	partially-accepted	Wording amended, "The airspace required following a critical loss of thrust on multi-engine airships must be published, if different from all-engines-operating."

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71	*Charles Luffman - Luffships*	SC GAS.2130 (d)	11	The approach and landing speeds, configurations, and procedures, which allow the flight crew of average skill to land within the published landing airspace volume consistently and without causing damage or injury, and which allow for a safe transition to the balked landing conditions.	Please change as follows: "The approach and grounding speeds, configurations .... of average skill to safely capture the airship consistently within the published airspace size constraints without causing damage or injury, and allows safe transition to continuing flight if the capture process must be aborted.	yes	no	partially-accepted	See EASA response comment #68.
72	*Charles Luffman - Luffships*	SC GAS.2135 (a)(6)	11	At all airspeeds with various ballonet or gas cell levels.	What is "with various ballonet or gas cell levels" meant to cover with respect to controllability?	yes	no	noted	Depending on the airship design controllability is dependent on ballonets and gas cells fill status and must be substantiated.
73	*Charles Luffman - Luffships*	SC GAS.2135 (b)	11	It shall be possible to make an emergency landing without assistance from ground personnel in the maximum surface wind speed in which operation is permitted with critical loss of thrust.	Please change to: "It shall be possible to abort flight and ground the airship in an emergency without ....".	yes	no	not accepted	EASA text is intentional as written.
74	*Charles Luffman - Luffships*	SC GAS.2140	11	It shall be possible to trim the airship by means of static and/or aerodynamic trim, in all conditions of loading, configuration, speed and power, such that the flight crew workload is commensurate with the safe handling of the airship during all flight phases. This applies during normal operations and at all cleared flight attitudes, and, if applicable:	Please revise as follows: ".... by means of aerostatic and/or aerodynamic trim methods, in ...., airspeed ....".	yes	no	partially-accepted	Wording amended, speed replaced by airspeed.
75	*Charles Luffman - Luffships*	SC GAS.2140 (a)	11	with any probable failure of the ballonet systems or other trim system;	probable ? surely the intent concerns potential or possible failures identified in an FMCEA	yes	no	noted	The objective of the requirement is to perform an analysis as means of compliance, as suggested by the commenter.
76	*Charles Luffman - Luffships*	SC GAS.2140 (a)	11	with any probable failure of the ballonet systems or other trim system;	How do the ballonet systems affect trim ?	yes	no	noted	Ballonet and gas cell lifting gas systems affect the airship trim.
77	*Charles Luffman - Luffships*	SC GAS.2145 (a)	11	The airship must be sufficiently stable in both the pitch and yaw axes in steady un-accelerated flight during climb, descent and level flight, with consistent use of the thrust controls, at any given trim condition and configuration in the flight envelope such that the flight crew workload is commensurate with the flying task.	This only relates to unidirectional airships!	yes	no	noted	See EASA response comment #11.
78	*Charles Luffman - Luffships*	SC GAS.2155 (a)	12	Safe ground handling procedures and Mooring procedures must be developed assuming the specified minimum Airship flight and ground crew, and covering all cleared Airship configurations, ancillary equipment and wind conditions.	What are "cleared Airship configurations"?	yes	no	noted	Wording amended cleared replaced by approved.
79	*Charles Luffman - Luffships*	SC GAS.2160 (c)	12	Envelope or hull distortion and/or deflection must not interfere with flight path control throughout the range of speed, power and envelope pressure, within the flight envelope.	Please change as follows, "Distortion and/or deflection of the airship's aerostat must not .... range of airspeed and power within the flight envelope." Please note, envelope pressure is specific to non-rigid types but is covered by the first part of the requirement by implication.	yes	no	partially-accepted	Wording amended, speed replaced by airspeed.
80	*Charles Luffman - Luffships*	SC GAS.2160 (d)	12	Envelope or hull distortion and/or deflection must not interfere with flight path control throughout the range of speed, power and envelope pressure, within the flight envelope	d) is a repeat a repeat of c) so needs deleting!	yes	no	accepted	Wording amended

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81	*Charles Luffman - Luffships*	SC GAS.2165 (c)	12	The applicant must develop an operating limitation to prohibit intentional flight, including take-off and landing, into icing conditions for which the airship is not certified to operate.	Please change as follows: ".... flight, including launch and capture, into ....".	yes	no	not accepted	See EASA response comment #66.
82	*Charles Luffman - Luffships*	SC GAS.2180	13	Maximum surface wind velocities for both flight and ground handling operations shall be determined and scheduled in the Flight Manual and Ground Handling Manual. The maximum wind speed must be at least 10 kts and for shall not be greater than the lesser of:	please delete the word 'for', so that it reads: ".... 10 kts and shall not ....".	yes	no	accepted	Wording amended
83	*Charles Luffman - Luffships*	SC GAS.2190 (a)	13	Procedures and relevant limitations for different levels of turbulence shall be determined for all cleared configurations and scheduled in the Flight Manual.	What are 'cleared configurations'?	yes	no	noted	See EASA response comment #78
84	*Charles Luffman - Luffships*	SC GAS.2190 (b)	13	The lifting gas pressure shall remain within safe limits during flight in rough air.	This requirement uses terminology based on magic/myth! Please change as follows: "The LTA-gas pressure ....".	yes	no	not accepted	See EASA response comment #6
85	*Charles Luffman - Luffships*	SC GAS.2200	14	**Structural Design Envelope**	The word 'Envelope' is used to describe one of the critical structural components of a non-rigid airship's aerostat, but is used here for a different purpose - thus causing confusion! It would be better to either delete it as a redundant word not needed or, if important, change it to an alternative word such as 'Scope' or 'Field'.	yes	no	noted	Further consideration deferred.
86	*Charles Luffman - Luffships*	SC GAS.2200	14	The structural design envelope must be determined, which describes the range and limits of airship design and operational parameters for which the applicant will show compliance with the specifications of this subpart. The design envelope must account for all airship design and operational parameters that affect structural loads, strength, durability, and aeroelasticity, including:	See previous comment!	yes	no	noted	See EASA response comment #85.
87	*Charles Luffman - Luffships*	SC GAS.2200 (c)	14	Mass variations and distributions over the applicable mass, heaviness and centre of gravity envelope, within the operating limitations;	Please change to: "Weight variations .... applicable weight, heaviness/lightness and centre of gravity range, within ....".	yes	no	not accepted	See EASA response comment #35.
88	*Charles Luffman - Luffships*	SC GAS.2200 (f)	14	Effects of aerostatic loads;	Does the requirement here concerning 'aerostatic loads' refer to 'statiic loads' due to aerodynamic effects from airflow, those due to buoyancy from the atmosphere and LTA-gas or all of them? Please clarify.	yes	no	partially-accepted	Wording amended, “aerostatic and aerodynamic”
89	*Charles Luffman - Luffships*	SC GAS.2210 (b)	14	Determine the loads required by paragraph (a) of this section at all critical combinations of parameters, on and within the boundaries of the structural design envelope, and	See SC Gas.2200 comment	yes	no	partially-accepted	See EASA response comment #88.
90	*Charles Luffman - Luffships*	SC GAS.2210 (c)	14	the magnitude and distribution of these loads must be based on established physical principles within the structural design envelope.	See SC.Gas 2200 comment	yes	no	partially-accepted	See EASA response comment #88.
91	*Charles Luffman - Luffships*	SC GAS.2215 (a)	15	Critical flight loads are established for symmetrical and asymmetrical loading from all combinations of flight parameters and load factors at and within the boundaries of the manoeuvre and gust envelope:	See SC.Gas 2200 comment	yes	no	partially-accepted	See EASA response comment #88.

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92	*Charles Luffman - Luffships*	SC GAS.2215 (a)(2)	15	at each mass from the design minimum mass to the design maximum mass; and	Please change to: "at each weight from the design minimum weight to the design maximum weight; and".	yes	no	not accepted	See EASA response comment #35.
93	*Charles Luffman - Luffships*	SC GAS.2215 (a)(4)	15	at each lift from the minimum design lift to the maximum design lift (static lift, aerodynamic lift, vectored thrust);	Please revise as follows: "at each lift application from .... (aeroatatic lift, aerodynamic lift, vertical thrust);". It should be noted that thrusters may be installed in fixed ways with no vectoring ability.	yes	no	not accepted	EASA text is intentional as written.
94	*Charles Luffman - Luffships*	SC GAS.2215 (a)(5)	15	when determining the loads, the influence of adverse environmental conditions, including the effects due to superheat, must be accounted for.	Poor punctuation! Please amend as follows, "when determining loads, the influence of adverse environmental conditions (including effects due to superheat} must be accounted for."	yes	no	partially-accepted	Wording amended, "when determining loads, the influence of adverse environmental conditions including effects due to superheat must be accounted for."
95	*Charles Luffman - Luffships*	SC GAS.2215 (b)	15	Vibration or buffeting must not result in structural damage up to VCD.	What is VCD ?	yes	no	noted	V_{CD} is defined in SC GAS.2000(a)(7)(ii)
96	*Charles Luffman - Luffships*	SC GAS.2225 (e)	15	Propulsion system	Propulsion system load conditions and effects.	yes	no	partially accepted	Wording amended, “Propulsion system load conditions.”
97	*Charles Luffman - Luffships*	SC GAS.2225 (f)	15		(f) Crew, Personnel and load conditions resulting from maintenance.	yes	no	accepted	Wording amended, “(f) added “Crew, Personnel and load conditions resulting from maintenance.”
98	*Charles Luffman - Luffships*	SC GAS.2245 (a)(1)	16	At all speeds within and sufficiently beyond the structural design envelope;	airspeeds ?	yes	no	accepted	Wording amended, “At all air speeds within and sufficiently beyond the structural design envelope.
99	*Charles Luffman - Luffships*	SC GAS.2250 (f)	17	The airship must be designed to ensure that after a likely bird impact the capability remains to conduct continued safe flight and landing.	Please note that birds also may scratch, peck and build nests in crevices or pockets. Insects can also cause damage!	yes	no	noted	Addressed through SC GAS.2260(a), in addition this topic must be addressed through pre-flight checks and preventative maintenance.
100	*Charles Luffman - Luffships*	SC GAS.2250 (f)	17	The airship must be designed to ensure that after a likely bird impact the capability remains to conduct continued safe flight and landing.	Please delete the word 'landing' and replace with 'capture'	yes	no	not accepted	See EASA response comment #15
101	*Charles Luffman - Luffships*	SC GAS.2260 (c)	17	Except as provided in paragraphs (f) of this section, the applicant must select design values that ensure material strength with probabilities that account for the criticality of the structural element. Design values must account for the probability of structural failure due to material variability.	paragraph (f) i.e. singular	yes	no	accepted	Wording amended
102	*Charles Luffman - Luffships*	SUBPART C — STRUCTURES	18	**STRUCTURAL OCCUPANT PROTECTION**	What is a structural occupant? Is it a robot? Confusion would be avoided by just using the title "OCCUPANT PROTECTION"	yes	no	not accepted	EASA text is intentional as written.
103	*Charles Luffman - Luffships*	SC GAS.2270 (a)	18	The airship, even when damaged in an emergency landing, must protect each occupant against injury that would preclude egress when:	Please change to: ".... emergency grounding event, must ....). Please note that the word 'landing' is especially wrong here because if people waited for the airship's state of heaviness to increase sufficiently for the airship to be considered landed (ground-borne) it would compromise safe escape!	yes	no	not accepted	EASA text is intentional as written.

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104	*Charles Luffman - Luffships*	SC GAS.2270 (a)(2)	18	the occupant experiences ultimate static inertia loads likely to occur in an emergency landing; and	Please revise as follows: ".... ultimate impact loads .... in an emergency grounding event ....".	yes	no	not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
105	*Charles Luffman - Luffships*	SC GAS.2270 (a)(3)	18	items of mass; including engines or auxiliary power units (APUs), within or aft of the crew and/or passenger compartment, that could injure an occupant, experience ultimate static inertia loads likely to occur in an emergency landing.	Please change to: "Heavy items greater than X kgf (EASA to define) , including .... experience ultimate impact inertia loads .... in an emergency grounding event."	yes	no	not accepted	EASA text is intentional written as objective requirement.
106	*Charles Luffman - Luffships*	SC GAS.2270 (b)	18	The emergency landing conditions specified in paragraph (a) of this section, must:	Please change to: "The emergency grounding conditions ....".	yes	no	not accepted	See EASA response comment #103.
107	*Charles Luffman - Luffships*	SC GAS.2270 (b)(1)	18	include dynamic conditions that are likely to occur in an emergency landing; and	Please change to: ".... in an emergency grounding event; and".	yes	no	not accepted	See EASA response comment #103.
108	*Charles Luffman - Luffships*	SC GAS.2270 (c)	18	The airship must provide protection for all occupants, accounting for likely flight, ground, water and emergency landing conditions	Please change to ".... emergency grounding conditions.	yes	no	not accepted	See EASA response comment #103.
109	*Charles Luffman - Luffships*	SC GAS.2305	19	**Landing gear and ground contact systems**	Please change to: "Ground fender arrangements and ground contact systems".	yes	no	not accepted	See EASA response comment #32.
110	*Charles Luffman - Luffships*	SC GAS.2305 (a)	19	The landing gear or ground contact system must be designed to:	Please change to: "The ground fender arrangements and ground contact systems must be designed to:"	yes	no	not accepted	See EASA response comment #32.
111	*Charles Luffman - Luffships*	SC GAS.2305 (a)(1)	19	provide stable support and / or control to the airship during ground operation; and	It should be noted that, for cross-field ground and handling operations, effective weight supported by the ground normally is small compared with all-up aircraft weight. As a result it is unlikely that the ground fender arrangements will be effective for ground steerage (i.e. control) making this part of the requirement redundant.			not accepted	EASA text is intentional as written.
112	*Charles Luffman - Luffships*	SC GAS.2305 (a)(2)	19	account for probable system failures and the operation environment.	'probable' should be replaced with 'possible'. After all, if failure was probable then the airship should not be launched into flight.			not accepted	See EASA response comment #75.
113	*Charles Luffman - Luffships*	SC GAS.2305 (a)(3)&(4)	19		Please add: (3) account for the airship's complex spring/mass system and added mass effects from surrounding air in a steady way. (4) account for ground conditions: tarmac, grass, soil, snow and ice, etc, concerning the operations for which approval is requested.			partially-accepted	Wording amended. (b)The airship must be designed to absorb the kinetic energy of the landing ~~performance,~~ taking into the airship's ~~complex~~ spring/mass system and virtual inertia ~~added mass effects from surrounding air in a steady way~~.
114	*Charles Luffman - Luffships*	SC GAS.2305 (c)	19	Adverse loading conditions must not cause damage to the essential systems of the airship, which could lead to a hazardous or catastrophic event if not detected.	Please revise as follows: "..... of the airship's descent rate arrest (including added mass) following ground contact without adverse spring back or bounce."			not accepted	EASA text is intentional written as objective requirement.

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115	*Charles Luffman - Luffships*	SC GAS.2305 (d)&(e)	19		Please add : (d) Following ground contact the fender arrangements must be able to follow the airships track across ground (sliding or rolling) without significant wear, and spread load adequately without adversely digging in, (e) For airships moored to a mast and allowed to freely weather-vane, pitch and roll, be designed to tolerate the many ground contact occasions and ways involved from such partially restrained flight.			not accepted	EASA text is intentional written as objective requirement.
116	*Charles Luffman - Luffships*	SC GAS.2310 (a)	19	Provide buoyancy in excess of the buoyancy required to support the maximum heaviness of the airship in fresh water; and	Revise as follows: "Provide means for buoyancy from water at a low position in excess .... in fresh water that prevents essential systems and the occupied compartments from being flooded; and"			not accepted	EASA text is intentional as written.
117	*Charles Luffman - Luffships*	SUBPART D — DESIGN AND CONSTRUCTION	19	**OCCUPANT SYSTEM DESIGN PROTECTION**	Delete the word 'Protection' as this is not the main purpose of this section and should be dealt with as a matter of design in the following requirements.			not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
118	*Charles Luffman - Luffships*	SC GAS.2315 (a)	19	With the crew and/or passenger compartment configured for take-off or landing, the airship is designed to:	Please revise as follows: ".... compartments configured for launch or capture, the airship shall be designed to:"			not accepted	See EASA response comment #15
119	*Charles Luffman - Luffships*	SC GAS.2315 (a)(1)	19	Facilitate rapid and safe evacuation of the airship in conditions likely to occur following an emergency landing on land or water, external cargo must be considered if applicable;	Change to make 2 sentences as follows: ".... following emergency grounding on land or water. External cargo ....".			partially-accepted	Wording amended. "Facilitate rapid and safe evacuation of the ~~airship~~ *occupants* in conditions likely to occur following an emergency landing ~~on land or water. External cargo must be considered if applicable~~;"
120	*Charles Luffman - Luffships*	SC GAS.2315 (a)(2)	19	Have means of egress (openings, exits or emergency exits), that can be readily located and opened from the inside and outside. The means of opening must be simple and obvious.	Change as follows: "Have sufficient means of egress via openings, exits or emergency exits that ....".			not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
121	*Charles Luffman - Luffships*	SC GAS.2320 (b)	20	The airship must provide each occupant with air at a breathable pressure, free of hazardous concentrations of gases, vapours and smoke during normal operations and likely failures.	Change 'likely' to 'potential'. After all, if such failures were likely then flight should not be allowed.			not accepted	EASA text is intentional as written, the draft consistently uses “likely”.
122	*Charles Luffman - Luffships*	SC GAS.2325 (a)(1)	20	Anticipated heat or energy dissipation or system failures or overheat that are expected to generate heat sufficient to ignite a fire;	Revise as follows: "Heating systems or .... or systems overheat that may generate heat ....".			not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
123	*Charles Luffman - Luffships*	SC GAS.2325 (b)(2)	20	Application of self-extinguishing, flame-resistant, or fireproof materials that are adequate to the application, location and certification level; or	Replace 'to' with 'for'			not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
124	*Charles Luffman - Luffships*	SC GAS.2330 (a)(2)	21	Any structural component the failure of which could result in serious or fatal injuries, extended periods of operation with reduced safety margins or loss of hull.	Revise as follows: ".... safety margins or aerostat loss."			not accepted	See EASA response comment #22.
125	*Charles Luffman - Luffships*	SC GAS.2330 (b)	21	A fire or other release of energy in a designated fire zone must not preclude continued safe flight and landing.	Replace 'landing' with 'capture'.			not accepted	See EASA response comment #22

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126	*Charles Luffman - Luffships*	SC GAS.2335	21	For operations where the exposure to lightning is likely, the airship must be protected against catastrophic effects of lightning.	Naturally, this is a subject needing particular specialist electromagnetic environmental effects expertise and where airship flight normally is in high risk lightning regions. However, former rigid types had a natural Faraday cage protecting them while non-rigids have large areas of fabric with little potential for a lighting strike attachment. The main problem thus lies in specific locations with high potential for a lightning strike. A requirement for lightning strike protection thus should be added to identify the high risk locations and methods for adequate protection.			noted	The objective of the paragraph is to address the direct affects of lightning.
127	*Charles Luffman - Luffships*	SC GAS.2350	21	**Airship envelope**	Please change to: "The airship's aerostat"			not accepted	Wording accepted by industry
128	*Charles Luffman - Luffships*	SC GAS.2350	21	The airship envelope or hull and its connecting structure must:	Please change to: "The airship's aerostat is the principle body for the atmosphere's displacement to gain sufficient aerostatic lift (buoyancy) under Archimedes' principle to float in the air with the airship's other installed parts, systems, disposable loads and payloads installed in &/or on it. It also is an aerodyne with shape to minimise drag and weight, maximise displacement (for buoyancy) and enable sufficient aerodynamic lift to balance airship heaviness/lightness levels however they may arise. Its design thus must:"			not accepted	EASA text is intentional as written.
129	*Charles Luffman - Luffships*	SC GAS.2355	21	**Lifting gas system**	Please change to: "LTA-gas system"			not accepted	See EASA response comment #6
130	*Charles Luffman - Luffships*	SC GAS.2355 (a)	21	Lifting gas systems required for the safe operation of the airship must:	Change to: "LTA-gas systems ...."			not accepted	See EASA response comment #6
131	*Charles Luffman - Luffships*	SC GAS.2355 (a)(2)	21	monitor and control lifting performance and degradation;	Change to: "monitor and control LTA-gas quantity (i.e. density x volume = mass)"			not accepted	See EASA response comment #6
132	*Charles Luffman - Luffships*	SC GAS.2355 (b)	21	If the lifting gas is toxic, irritant or flammable, adequate measures must be taken in design and operation to ensure the safety of the occupants and people on the ground in all envisaged ground and flight conditions.	Change as follows: "If the aerostat's LTA-gas is toxic, an irritant .... the safety of airship occupants and ground personnel in all ....".			not accepted	See EASA response comment #6
133	*Charles Luffman - Luffships*	SC GAS.2360 (c)	22	Protect adjacent structure or systems whose damage or failure would prevent continued safe flight and landing.	Change 'landing' to 'capture'			not accepted	See EASA response comment #15
134	*Charles Luffman - Luffships*	SC GAS.2360 (e)	22	For external payload adequate means are provided to enable the release of payload quickly during flight throughout the approved operational envelope without causing hazards to the airship	Change to: "For external payloads, adequate means shall be provided to enable their rapid release during flight ....".			partially-accepted	Wording amended, “For external payloads, adequate means must be provided to enable their rapid release during flight ...."
135	*Charles Luffman - Luffships*	SC GAS.2370	22	**Systems for Ballast which is Disposable in Flight**	Change to: "Systems for Disposable Ballast in Flight"			accepted	Wording amended

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136	*Charles Luffman - Luffships*	SC GAS.2370 (a)	22	the system must be designed and installed so as to ensure controlled disposal or transfer of the ballast intended for maintaining equilibrium of the airship under all normal and emergency operating conditions while preventing critical load distributions in the airship.	Change as follows to: ".... intended while maintaining .... operating conditions, and preventing critical airship load distribution."			accepted	Wording amended, “the system must be designed and installed so as to ensure controlled disposal or transfer of the ballast intended while maintaining equilibrium of the airship under all normal and emergency operating conditions and preventing critical load distributions in the airship.”
137	*Charles Luffman - Luffships*	SC GAS.2380 (a)	22	The applicant must determine the ancillary ground equipment and establish the performance, the design requirements and the procedures applicable for the safe operation of the airship.	Change to: ".... establish its performance, the design requirements and procedures applicable for safe airship operation."			accepted	Wording amended
138	*Charles Luffman - Luffships*	SC GAS.2380 (c)	22	The airship must be mored and prevented from unintended movement or free flight.	Change to: "The airship must have mooring arrangements that prevent its unintended movement or free flight."			partially-accepted	Wording amended, “While moored, the airship must be prevented from unintended movement or free flight."
139	*Charles Luffman - Luffships*	SC GAS.2400 (a)	23	For the purpose of this subpart, the airship propulsion system installation must include each component that is necessary for propulsion, affects propulsion safety, or provides auxiliary power to the airship.	Change to: ".... affects propulsion ability and safety, or ...."			accepted	Wording amended
140	*Charles Luffman - Luffships*	SC GAS.2400 (b)	23	Each airship engine, propeller and auxiliary power unit (APU) must be type certified, or meet accepted specifications.	Change to: "Each airship motor, propeller ...." Note: A motor may be electrically or fuel powered, but an engine normally is only fuel powered!			not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5, SC E-19) Industry common understanding is that engine, includes electrical engines, e.g. as part of an Electric Hybrid Propulsion System.
141	*Charles Luffman - Luffships*	SC GAS.2400 (d)	23	Hazardous accumulations of fluids, vapours or gases are isolated from the airship and personnel compartments and are safely contained or discharged.	Change to: ".... or gases shall be isolated from .... compartments and be safely ....".			partially-accepted	Wording amended, “Hazardous accumulations of fluids, vapours or gases must be isolated from the airship and personnel compartments and be safely contained or discharged.”
142	*Charles Luffman - Luffships*	SC GAS.2400 (e)	23	Installations of propulsion system components that deviate from the component limitations or installation instructions must be shown to be safe.	Change to: "Propulsion system component installations that ...."			accepted	Wording amended
143	*Charles Luffman - Luffships*	SC GAS.2400 (f)	23	For the purposes of this subpart, ‘energy’ means any type of energy for the propulsion system, including, for example, fuels of any kind or electric current.	Change to: ".... any type of energy used by the propulsion ....."			accepted	Wording amended
144	*Charles Luffman - Luffships*	SC GAS.2405	23	The integrity of the propulsion system including mounting and accessory attachment must be demonstrated throughout the flight envelope of the airship.	Change to: "Integrity of the propulsion system, including .... accessory attachments, must ....".			accepted	Wording amended
145	*Charles Luffman - Luffships*	SC GAS.2415 (a)	23	The airship design must prevent foreseeable accumulation or shedding of ice or snow that adversely affect Propulsion System operation.	Change to: ".... adversely affects ...."			accepted	Wording amended
146	*Charles Luffman - Luffships*	SC GAS.2415 (b)	23	The Propulsion System installation design must prevent any accumulation of ice or snow that adversely affects Propulsion System operation in those icing conditions for which certification is requested.	Change to: "The Propulsion System and associated installation arrangements must prevent ....".			not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
147	*Charles Luffman - Luffships*	SC GAS.2425	23	The installed propulsion system must operate without any hazardous characteristics during normal and emergency operation within the range of operation limitations for the airship and propulsion system.	Change to: ".... within the range of operating limitations ....".			accepted	Wording amended

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148	*Charles Luffman - Luffships*	SC GAS.2430 (a)(2)	24	be designed to prevent catastrophic events due to lightning strikes taking into account direct and indirect effects for airship unless it is shown that exposure to lightning is unlikely.	Change to: ".... direct and indirect airship effects unless it is shown that a lightning strike attachment is unlikely."			partially-accepted	Wording amended, “be designed to prevent catastrophic events due to lightning strikes taking into account direct and indirect effects for airships unless it is shown that exposure to lightning is unlikely.”
149	*Charles Luffman - Luffships*	SC GAS.2430 (a)(6)	24	be designed to retain the energy under all likely operating conditions and minimise hazards to the occupants and people on the ground during any survivable emergency landing. Failure due to overload of the landing system must be taken into account.	Change to: ".... survivable emergency situation. Failure due to overload of the grounding system ....".			not accepted	See EASA response comment #15
150	*Charles Luffman - Luffships*	SC GAS.2430 (b)	24	Each storage system must:	Change to: "Each energy storage ...."			accepted	Wording amended
151	*Charles Luffman - Luffships*	SC GAS.2430 (b)(4)	24	provide energy for a sufficient reserve based on a standard flight; and	Change to: ".... standard flight plan; and"			not accepted	EASA text is intentional as written.
152	*Charles Luffman - Luffships*	SC GAS.2435 (a)	24	Propulsion support systems are all systems whose direct purpose is to support the Propulsion System or the energy storage device in its intended function as part of the propulsion system.	Change to: ".... are those systems designed specifically to support the Propulsion System or the energy storage devices in their intended roles as ...."			partially-accepted	Wording amended, “Propulsion support systems are all systems the direct purpose of which is to support the Propulsion System or the energy storage device in its intended function as part of the propulsion system.
153	*Charles Luffman - Luffships*	SC GAS.2435 (b)	24	Propulsion support systems that have a direct effect on the engine availability must be considered in the engine reliability.	Change to: ".... that directly affect motor availability must be considered regarding motor reliability."			partially-accepted	Wording amended, “that directly affect engine availability must be considered regarding engine reliability.
154	*Charles Luffman - Luffships*	SC GAS.2435 (c)	25	Propulsion support systems must be designed for the operating conditions applicable to the location of installation.	Change to: ".... applicable to the installation's location.			accepted	Wording amended
155	*Charles Luffman - Luffships*	SC GAS.2435 (f)	25	Ingestion of likely foreign objects that would be hazardous to the engine must be prevented.	Change to: ".... hazardous to the motor must be prevented."			not accepted	See EASA response comment #140
156	*Charles Luffman - Luffships*	SC GAS.2435 (g)	25	The flight crew must be aware of the air intake configuration and able to influence it.	Change to: "Arrangements to enable flight crew awareness of the propulsion system's air intake configuration with ability to influence it shall be provided."			not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
157	*Charles Luffman - Luffships*	SC GAS.2445 (f)	25	Techniques and associated limitations for engine operation, including design features when pilot error is likely to occur; and	Change to: ".... limitations for motor operation, including design aspects that may affect pilot judgment, leading to error.			partially-accepted	Wording amended
158	*Charles Luffman - Luffships*	SC GAS.2500 (a)	26	Requirements .2500, .2505 and .2510 are general specifications applicable to systems and equipment installed in the airship and should not be used to supersede any other specification in this document.	Change to: ".... in the airship that should not ...."			accepted	Wording amended
159	*Charles Luffman - Luffships*	SC GAS.2500 (b)	26	Equipment and systems required to comply with type certification specifications, airspace requirements or operating rules, or whose improper functioning would lead to a hazard, must be designed and installed so that they perform their intended function throughout the operating and environmental limits for which the airship is certificated.	Change to: ".... or operating rules, where incorrect functioning could lead .... so that they will perform their intended function properly throughout ....".			accepted	Wording amended

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160	*Charles Luffman - Luffships*	SC GAS.2505	26	**General Requirements on Equipment Installation**	Change to: "General Requirements for Equipment Installation"			accepted	Wording amended
161	*Charles Luffman - Luffships*	SC GAS.2510 (b)	26	The operation of equipment and system not covered by SC.GAS.2500, must not cause a hazard to the airship or its occupants throughout the operating and environmental limits for which the airship is certified.	Change to: "The operation equipment and systems …."			partially-accepted	Wording amended, "The operation of equipment and system**s** …"
162	*Charles Luffman - Luffships*	SC GAS.2515 (a)	26	each system that performs a function, the failure of which would prevent continued safe flight and landing must be designed and installed such that:	Change to: "each system performing a …. safe flight and capture …."			partially-accepted	Wording amended, "each system performing a …." See EASA response comment #15
163	*Charles Luffman - Luffships*	SC GAS.2515 (a)(1)	26	The function at the airship level is not adversely affected during and after the time the airship is exposed to indirect effect of lightning; and	Change to: "The airship level function is not …. indirect effects of …."			partially-accepted	Wording amended, "The function at airship level is not adversely affected during and after the time the airship is exposed to indirect effects of lightning; and"
164	*Charles Luffman - Luffships*	SC GAS.2515 (a)(2)	26	The system recovers normal operation of that function in a timely manner after the airship is exposed to indirect effect of lightning unless the system's recovery conflicts with other operational or functional requirements of the system.	Change to: "Unless the system's recovery conflicts with other systems' operational or functional requirements, system recovery to normal operation of its function shall occur in a timely manner after the airship's exposure to the indirect effect of lightning ends."			not accepted	EASA text is intentional as written.
165	*Charles Luffman - Luffships*	SC GAS.2515 (b)	27	Each system that performs a function, the failure of which would significantly reduce the capability of the airship or the ability of the flight-crew to respond to an adverse operating condition, must be designed and installed such that the system recovers normal operation of that function in a timely manner after the airship is exposed to lightning	Change to: "….after the airship's exposure to lightning ends."			not accepted	EASA text is intentional as written.
166	*Charles Luffman - Luffships*	SC GAS.2520 (a)	27	Each electrical and electronic system that performs a function, the failure of which would prevent the continued safe flight and landing of the airship, must be designed and installed such that:	Change to: "Each electrical and electronic system performing a …. safe flight and capture …."			partially-accepted	Wording amended, "…. system performing a …." See EASA response comment #15
167	*Charles Luffman - Luffships*	SC GAS.2520 (a)(1)	27	The function at the airship level is not adversely affected during and after the time the airship is exposed to the HIRF environment; and	Change to: "The airship level function is not …. "			partially-accepted	Wording amended, "The function at airship level is not….."
168	*Charles Luffman - Luffships*	SC GAS.2520 (a)(2)	27	The system recovers normal operation of that function in a timely manner after the airship is exposed to the HIRF environment, unless the system's recovery conflicts with other operational or functional requirements of the system.	Change to: "Unless the system's recovery conflicts with other systems' operational or functional requirements, system recovery to normal operation of its function shall occur in a timely manner after the airship's exposure to the HIRF environment ends."			not accepted	EASA text is intentional as written.
169	*Charles Luffman - Luffships*	SC GAS.2520 (b)	27	For airship approved for IFR operations, each electrical and electronic system that performs a function, the failure of which would reduce the capability of the airship or the ability of the flight-crew to respond to an adverse operating condition, must be designed and installed such that the system recovers normal operation of that function in a timely manner after the airship is exposed to the HIRF environment.	Change to: "For an airship approved …. after the airship's exposure to the HIRF environment ends."			partially-accepted	Wording amended, "For airships approved….."

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170	*Charles Luffman - Luffships*	SC GAS.2525 (a)	27	Supply the power required for operation of connected loads during all intended operating conditions;	Amend as follows: ".... connected electrical loads ...." Note: if not electrical loads, then EASA should otherwise clarify the type of load involved.			not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
171	*Charles Luffman - Luffships*	SC GAS.2525 (b)	27	Ensure no single failure or malfunction will prevent the system from supplying the essential loads required for continued safe flight and landing; and	Amend as follows: ".... essential electrical loads .... flight and capture; and"			not accepted	See EASA responsed comment #15 and #170.
172	*Charles Luffman - Luffships*	SC GAS.2525 (c)	27	Have enough capacity, if the primary source fails, to supply essential loads, including non-continuous essential loads for the time needed to complete the function, required for safe flight and landing.	Amend as follows: ".... essential electrical loads, including those that are not continuous but essential for the time .... flight and capture."			not accepted	See EASA responsed comment #15 and #170.
173	*Charles Luffman - Luffships*	SC GAS.2530 (b)	27	The position and anti-collision lights rules must have the intensities, flash rate, colours, fields of coverage, and other characteristics to provide sufficient time for another aircraft or airship to avoid a collision.	Amend as follows: ".... lights' ability must .... collision in accordance with air navigation rules."			partially-accepted	Wording amended, “The position and anti-collision lights must have the intensities, flash rate, colours, fields of coverage, and other characteristics to provide sufficient time for other aircraft to avoid a collision.”
174	*Charles Luffman - Luffships*	SC GAS.2530 (c)	27	The anti-collision lights must be distributed in such a way that no aircraft or airship crossing the airship flight path might endeavour to fly between the bow and stern lights	Amend as follows: ".... no other aircraft of any type crossing the airship's flight path .... between the lights." Note: although unidirectional airships may be very long, balloons are not and new omni-directional airships may not have a definitive bow or stern (as for balloons) and be able to fly in any lateral direction regardless of heading!			partially-accepted	Wording amended, “The anti-collision lights must be distributed along the airship such that other aircraft can identify the full dimension of the airship from bow to stern in a timely manner.”
175	*Charles Luffman - Luffships*	SC GAS.2530 (d)	27	Any additional lights required for night operations, such as landing lights, must be installed on both airship and ground equipment	Amend as follows: ".... night operations, such as capture lights, must be installed on both the airship ...."			not accepted	See EASA responsed comment #15.
176	*Charles Luffman - Luffships*	SC GAS.2540	28	Pressurised systems must withstand appropriate proof and burst pressures.	This is an impossible requirement to satisfy - a contradiction in terms! It should be amended with regard to intent bearing in mind safety factors that may be needed and the system involved. Is it to do with pressure from fluid in pipes, storage chambers (e.g. gas in bottles), the aerostat's components (such as a non-rigid's envelope), cabin pressure or what? Previous airship regulations stipulated a safety factor of 4 or 5 on the limit load of envelope materials due to the possibility of long term creep rupture and low rip resistance of fabrics many years ago. These failure possibilities were not mentioned in this SC, but are aspects that need to be addressed.			noted	Paragraph renumbered to SC GAS.2545.
177	*Charles Luffman - Luffships*	SC GAS.2555 (a)	28	Is installed so as to ensure accurate and intelligible recording and safeguarding of the required data also in conditions encountered during crash, water immersion or fire;	Amend as follows: "Shall be installed .... recording that safeguards the required data, including under conditions .... immersion and fire;"			partially-accepted	Wording amended, “Must be installed to ensure accurate and intelligible recording that safeguards the required data, including under conditions encountered during crash, water immersion and fire;”
178	*Charles Luffman - Luffships*	SC GAS.2555 (b)	28	Is powered by the most reliable power source and remains powered for as long as possible without jeopardising service to essential or emergency loads and emergency operation of the airship;	Amend as follows: "Shall be powered .... emergency electrical loads and ...."			partially-accepted	Wording amended, “Must be powered ....” See EASA response comment #170.

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179	*Charles Luffman - Luffships*	SC GAS.2555 (c)	28	Includes features to facilitate the localisation of memory medium after an accident; and	Amend as follows: "Shall include features ...."			partially-accepted	Wording amended, “Must include features to ….”
180	*Charles Luffman - Luffships*	SC GAS.2555 (d)	28	Is installed so that it automatically records when the airship is capable of moving under its own power.	Amend as follows: "Shall be installed ...."			partially-accepted	Wording amended, “Must be installed to automatically record when….”
181	*Charles Luffman - Luffships*	SC GAS.2600 (c)	29	If for the operation of the airship any patrolling of the interior of the airship or working outside of the passenger or flight crew compartments is required then adequate safety provisions, including means of access, must be provided for flight crew members performing these activities.	Amend as follows: "If for operation of the airship patrol of the airship's interior or external work on the passenger or crew compartments is required, then ...." What is the intent of patrol? Is this to do with inspection, cleaning or what? When that has been established then further change should be added to say what's needed e.g. patrol to inspect and maintain the airship's			not accepted	EASA text is intentional as written.
182	*Charles Luffman - Luffships*	SC GAS.2600 (d)	29	The flight crew interface design must allow for continued safe flight and landing after the loss of vision through any one of the windshield panels.	Amend as follows: ".... and capture after loss of ...."			not accepted	See EASA response comment #15.
183	*Charles Luffman - Luffships*	SC GAS.2605 (b)	29	There must be a discernible means of providing system operating parameters required to operate the airship, including warnings, cautions, and normal indications to the responsible crewmember.	crew member.			accepted	Wording amended
184	*Charles Luffman - Luffships*	SC GAS.2605 (d)	29	Information related to safety equipment is easily identifiable and its method of operation is clearly marked.	Amend as follows: ".... equipment shall be easily identifiable and the equipment's method of operation must be clearly marked."			partially-accepted	Wording amended, “….equipment must be easily identifiable and the equipment's method of operation must be clearly marked."
185	*Charles Luffman - Luffships*	SC GAS.2615	29	This paragraph applies to installed equipment intended for flight-crew members’ use in the operation of the aeroplane from their normally seated positions on the flight deck. This installed equipment must be shown, individually and in combination with other such equipment, to be designed so that qualified flight-crew members trained in its use can safely perform their tasks associated with its intended function by meeting the following requirements:	Amend as follows: ".... members' use concerning operation of the airship from their seated flight deck positions. The installed .... associated with intended function ....".			partially-accepted	Wording amended, “This paragraph applies to installed equipment intended for flight-crew members’ use in the operation of the airship from their normally seated positions on the flight deck. This installed equipment must be shown, individually and in combination with other such equipment, to be designed so that qualified flight-crew members trained in its use can safely perform their tasks associated with its intended function by meeting the following requirements:
186	*Charles Luffman - Luffships*	SC GAS.2615 (a)	30	Flight deck controls must be installed to allow accomplishment of these tasks and information necessary to accomplish these tasks must be provided.	Amend as follows: ".... accomplishment of their tasks ...."			not accepted	EASA text is intentional as written. (Reference CS-25.1302)
187	*Charles Luffman - Luffships*	SC GAS.2615 (b)(3)	30	Enable flight crew awareness, if awareness is required for safe operation, of the effects on the aeroplane or systems resulting from flight crew actions.	Amend as follows: ".... on the airship or...."			accepted	Wording amended, “Enable flight crew awareness, if awareness is required for safe operation, of the effects on the airship or systems resulting from flight crew actions.”
188	*Charles Luffman - Luffships*	SC GAS.2615 (d)	30	To the extent practicable, installed equipment must enable the flight crew to manage errors resultingfrom the kinds of flight crew interactions with the equipment that can be reasonably expected in service, assuming the flight crew is acting in good faith. This subparagraph (d) does not apply to skill-related errors associated with manual control of the aeroplane.	Amend as follows: ".... airship."			accepted	Wording amended.

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189	*Charles Luffman - Luffships*	SC GAS.2615 (e)(1)(i)	30	identify non-normal operation or aeroplane system conditions, and	Amend as follows: ".... or airship system ...."			accepted	Wording amended.
190	*Charles Luffman - Luffships*	SC GAS.2615 (g)(2)	30	provide timely attention-getting cues through at least two different senses by a combination of aural, visual, or tactile indications;	For airships, which have benign behaviour compared with aeroplanes and are not known for falling out of the sky like them, the tranch of requirements imposed here perhaps is OTT. It also is known that pilot's become conditioned to such warnings (to ignore them) and can be distractive at critical moments, which I've experienced as a car driver and seen from my wife's reactions, causing anxiety. When listening to the story of a group of young aircraft engineers after being given an airship experience flight for the first time when, during launch at full power with an acute nose up angle, the pilot pulled the throttles right back. From the audible cue (it became quiet from loss of engine and propeller noise) they immediately adopted the crash position. Then, when nothing bad happened and with the airship continuing its nose up ascent, they looked up to see the pilot grinning at them! This also would be the case for wide body airships with reduced LTA-gas fill %. To overcome the issues it would be best to first add a data information requirement to identify necessary/essential attention cue methods and consideration for the appropriate cues to install.			noted	Further considerations deferred. EASA text is intentional as written. (Reference CS-2**5.1322**)
191	*Charles Luffman - Luffships*	SC GAS.2615 (h)(2)	31	provide a means to suppress an attention-getting component of an alert caused by a failure of the alerting function that interferes with the flight crew's ability to safely operate the aeroplane. This means must not be readily available to the flight crew so that it could be operated inadvertently or by habitual reflexive action.	Amend as follows: ".... operate the airship. This ...." Note: from correcting this oversight many times it's clear where the rules came from - i.e. a source with different aircraft behaviour and operation that is largely inappropriate, emphasizing need to use the different terminology for airships given in these comments. This is necessary in order to properly understand the differences of other aircraft and to introduce appropriate regulations that don't cause confusion or unnecessary burden on airship applicants, which has been the case for many years.			accepted	Wording amended.
192	*Charles Luffman - Luffships*	SC GAS.2615 (i)(2)	31	use visual coding techniques, together with other alerting function elements on the flight deck, to distinguish between Warning, Caution and Advisory alert indications, if they are presented on monochromatic displays that are incapable of conforming to the colour convention in paragraph (e)(1).	(i)(1)			accepted	Wording amended
193	*Charles Luffman - Luffships*	SC GAS.2620 (g)	31	Any other information necessary for the safe operation of the airship.	Change as follows: ".... for safe ...."			accepted	Wording amended

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194	*Charles Luffman - Luffships*	SC GAS.2625 (j)	32	The instructions for continued airworthiness must contain a section titled 'Airworthiness Limitations' that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure required for type certification. This section must contain a legible statement in a prominent location that reads: 'The airworthiness limitations section is approved and variations must also be approved.'	Amend as follows ".... and variations or modifications must ...."			not accepted	EASA text is intentional as written.
195	*Charles Luffman - Luffships*	SC GAS.2625 (k)	32	The applicant must develop and implement procedures to prevent structural failures due to foreseeable causes of strength degradation, which could result in serious or fatal injuries, loss of hull, or extended periods of operation with reduced safety margins. The Instructions for Continued Airworthiness must include procedures developed under requirement .2255.	Amend as follows: "....loss of the aerostat, or			not accepted	See EASA response comment #22.
196	*Antrack, Florian*	SC GAS.2000 (a)	6	Under (a) missing: Definition of piloting Skills for Airship operation	(xx): for pilot skills definition regarding to response times workloads and forces for stearing an Airship, refer to _____		yes	not accepted	Average pilot skills are well understood in industry.
197	*Antrack, Florian*	SC GAS.2400 (c) (1)	23	All ~~Likely operating~~ conditions, including foreign Objects…	All normal, abnormal and emergency operating conditions,…	yes		not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
198	*Antrack, Florian*	SC GAS.2430 (b) (1)	24	Withstand the loads under ~~likely~~ operating conditions without…..	Withstand the loads under normal, abnormal and emergency operating conditions without…..	yes		not accepted	See EASA response comment #198.
199	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2000 (a) (1)	6	The Flight Envelope is defined with respect to "normal acceleration" which stands in contradiction to SC GAS.2103 (b) accounting for the "most adverse conditions"	Check requirements for consistency.		Yes	not accepted	EASA text is intentional as written. Normal acceleration mans perpendicular to the flight path.
200	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2000 (a) (2)	6	Phases "climb" and "descent" are not explicitly included in the flight phases.	Add if applicable.	Yes		accepted	Wording amended
201	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2000 (a) (2)	6	It is not required that the intended operation or any other flight phase must be specified by the applicant	This requirement shall be added.		Yes	not accepted	SC GAS.2000 (a) (2) is a definition and not a requirement. In any case an applicant must define the concept of operation in order to assess the applicability of this special condition.
202	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2000 (a) (3)	6	A hybrid airship is thus not covered by the defined term airship as per being "lighter-than-air" aircraft.	A hybrid airship cannot be covered using this definition. A separate definition must be used.		Yes	not accepted	EASA also considers hybrid airships as lighter than air aircraft. The definition originates from ICAO Annex I.
203	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2000 (a) (5)	6	The "difference between airship mass and static lift" compares two different physical entities.	Please correct the definition.		Yes	not accepted	See EASA response comment #21.
204	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2000 (a) (6)	6	The term "exceptional pilot skill or strength" is subjective	If applicable, refer to existing standards.	Yes		not accepted	See EASA response comment #196.
205	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2000 (a) (6)	6	"[…] the airship […] must mitigate risks" uses impersonification of the airship itself.	Use "the airship design …"	Yes		accepted	Wording amended.

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206	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2000 (a) (6)	6	~~In consequence: landing the airship by deliberate action resulting in damaging the airship and eventual hull loss is considered "Continued safe flight and landing".~~				not accepted	Comment unclear.
207	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2010 (b)	7	The term "acceptable" is subjective.	Use reference to existing MoC requirements	Yes		not accepted	EASA text is intentional as written.
208	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2100 (a)	8	The definition of the term "safe operation of the airship" is found to be undefined and is hence subject to interpretation.	Define the term.		Yes	not accepted	EASA text is intentional as written.
209	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2100 (b)	8	The requirement is found to be too extensive and may not be verifiable.	Rewrite and break down into smaller requirements.		Yes	not accepted	EASA text is intentional as written.
210	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2100 (d)	8	The term "sufficient accuracy to control the airship" is found to be subjective.	Be more specific,	Yes		not accepted	EASA text is intentional as written.
211	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2103 (b)	8	The term "most adverse conditions" wr.t. flight configuration is unspecific and may or may not contain devices failures.	Be more specific.		Yes	not accepted	EASA text is intentional as written.
212	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105	8	The term "performance data" is found to be undefined.	Define the term.		Yes	not accepted	EASA text is intentional as written.
213	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (a)	8	This subpart refers to "performance requirements" which it does not define.	Define the term.		Yes	not accepted	EASA text is intentional as written.
214	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (a)	8	The term "operating envelope" is found to be undefined and hence is subject to interpretation.	Define the term. Maybe refer to defined terms e.g. "flight envelope".		Yes	not accepted	EASA text is intentional as written.
215	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (a) (1)	8	The term "ambient atmospheric conditions" is found to be undefined.	Define the term.		Yes	not accepted	EASA text is intentional as written.
216	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (a) (2)	8	The requirement is unspecific.	Be specific.		Yes	not accepted	EASA text is intentional as written.
217	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (b) (2)	8	There is no requirement for the applicant to provide "the range of operating limitations", hence undefined.	Check the requirements for consistency.		Yes	not accepted	Operating limitations are required to be defined by SC GAS.2620
218	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (b) (2)	8	The term "Atmospheric conditions above and below standard atmosphere" effectively means any conditions.	Be specific.		Yes	not accepted	EASA text is intentional as written.
219	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (c) (1)	8	The reference is missing.	Please add.		Yes	accepted	See EASA response comment #44.
220	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (c) (2)	8	The sentence is malformed.	Please correct.		Yes	not accepted	EASA text is intentional as written.
221	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (d)	8	The verb "select" is misleading. The sentence "The procedures must be established for all applicable conditions and configurations" is too general.	Be more specific.		Yes	partially-accepted	Wording amended.
222	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (e)	9	The term "average skill" is subjective.	Use defined terms.	Yes		not accepted	See EASA response comment #196.

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223	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (e)	9	The sentence is contradictory to GAS.2105 (b) (2)	Check the requirements for consistency.		Yes	not accepted	EASA text is intentional as written, there is no contradiction.
224	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (f)	9	This statement is inconsistent and unspecific. What could 'losses due to operations' even mean?	There shall be a defined expected range of atmospheric conditions, a defined flight envelope for each flight condition, and a detailed set of allowable procedures that represent the boundary conditions for the specification of the performance data. The specified performance data must then be verified by flight tests at the boundary conditions of the above mentionend, clearly specified conditions.		Yes	not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
225	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2105 (g)	9	The term “various levels of turbulence” is found to by highly unspecific.	Be more specific.		Yes	not accepted	EASA text is intentional as written.
226	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2110 (c)	9	The verb “determination” is redundant	Please correct.	Yes		accepted	Wording amended.
227	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2111 (a)	9	The term “normal operation” is found to be undefined.	Define or change the term.		Yes	not accepted	EASA text is intentional as written. “Normal operation” is a standing term used within aviation.
228	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2113 (a) (1)	9	The sentence “A stall warning shall be installed, if the airship stalls” is found to be unprecise.	Please correct.		Yes	accepted	Wording amended
229	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2113 (c) (2)	9	The stall warning is required to be “sufficiently compelling” which is found to be inconsistent.	This requirement shall be corrected.		Yes	not accepted	EASA text is intentional as written.
230	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2115 (a) (1)	10	The requirement might remain unmet if the airship does not stall, as per GAS.2113 (a) (1)	Check the requirements for consistency.	Yes		not accepted	EASA text is intentional as written. If the airship design does not show aerodynamic stall behaviour the requirement is not applicable.
231	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2115 (a) (4)	10	The sentence is found to be malformed.	Please correct.		Yes	accepted	Wording amended, see EASA response comment #60.
232	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2120 (b)	10	The reference to “all conditions” is found to be undefined.	Please specify which conditions shall be considered.		Yes	not accepted	EASA text is intentional as written. The objective requirement refers to “all conditions using maximum continuous forward thrust”.
233	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2122 (a)	10	The term “one or more critical engine(s)” might effectively include all engines, because remaining engines become even more critical. This requirement is found to be unincorporable.	This requirement shall be corrected.		Yes	not accepted	Possible follow on effects of a failure case are not considered, as addressed through emergency procedures.
234	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2122 (b)	10	The term “critical loss of thrust” is found to be undefined.	Define or change the term.		Yes	not accepted	EASA text is intentional as written. “critical loss of thrust” is a standing term used within aviation.
235	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2125 (a)	10	The term “performance data” as well as “most critical configuration” is found to be undefined.	Define the terms.		Yes	not accepted	EASA text is intentional as written. “performance data” and “most critical configuration” are standing terms used within aviation. Configuration is defined in SC GAS.2000(a)(11)
236	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2125 (b)	10	The term “a time period short enough to recover from potentially hazardous condition” is found to be unprecise.	Define or change the term.	Yes		accepted	Wording amended, “During any cargo exchange or reballasting operation the airship must be capable of continued safe flight and landing following a potentially hazardous condition.”

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237	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2130 (b)	10	The term “combinations of flight phases” is found to be misleading, because flight phases do not combine.	This requirement shall be corrected.		Yes	accepted	Wording amended.
238	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2130 (b)	10	The sentence “Wind within the operational limits:” seems to be misplaced.	Please correct.	Yes		accepted	Wording amended.
239	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2130 (b)	11	The term “performance data” is undefined. Data can not be “established”	Define or change the term.	Yes		not accepted	See EASA response comment #235.
240	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2135 (a) (6)	11	The sentence is found to be unprecise.	Please correct.	Yes		accetped	Wording amended, “At all airspeeds and within the range of ballonet or gas cell levels the airship is designed for”
241	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2140	11	The section “Trim” is found to be unprecise. The requirement applies only to “normal operations” which is found to be unsufficient.	Please rewrite the section and correct the scope of the requirement.		Yes	not accepted	EASA text is intentional as written.
242	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2145 (b)	12	The terms “normal” and “exceptional” are found to be subjective.	This requirement shall be corrected.	Yes		not accepted	Wording is commonly used in certification requirements by various authorities.
243	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2180 (a)	13	The sentence: “The maximum wind speed …” is malformed and does not provide a meaningful definition.	Please correct.		Yes	accepted	Wording amended, “The maximum wind speed must be at least 10 kts and must not be greater than the lesser of:”
244	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2300 (a) (1)	19	The terms “easily, smoothly, and positively” are found to be subjective.	Consider rewording.	Yes		not accepted	Wording is commonly used in certification requirements by various authorities.
245	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2300 (a) (2)	19	The requirement is found to be unspecific.	Consider rewording.	Yes		not accepted	EASA text is intentional as written.
246	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2300 (b) (2)	19	The requirement is found to be unspecific and subjective.	Consider rewording.	Yes		not accepted	EASA text is intentional as written.
247	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2305 (b)	19	The requirement is found to be unprecise w.r.t the landing loads	Consider further specification.	Yes		partially-accepted	Wording amended. W.r.t. landing loads refer to SC GAS.2210.
248	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2300 (c)	19	The requirement is found to be unspecific without reference to the landing loads during the landing envelope.	Consider rewording and adding of reference.		Yes	not accepted	See EASA response comment #248
249	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2315 (a) (2)	19	The terms “readily”, “simple”, and “obvious” are found to be subjective.	Consider rewording.	Yes		not accepted	See EASA response comment #244
250	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2340 (a)	21	The sentence is found to be too generic and not specific w.r.t. “Fire and High Energy Protection”	Consider further specification.		Yes	not accepted	EASA text is intentional as written.
251	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2350	21	The requirement is found to be too generic and not specific w.r.t. “Fire and High Energy Protection”	Consider further specification or re-sectioning.		Yes	noted	-
252	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2355	21	This section is found not to be specific w.r.t “Fire and High Energy Protection”	Consider further specification or re-sectioning..		Yes	noted	-
253	*Sebastian Trowitzsch, Aerarium e.V.*	SC GAS.2370	22	This section is found not to be specific w.r.t “Fire and High Energy Protection”	Consider further specification or re-sectioning..		Yes	noted	-

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254	*Johannes Eissing* *Aerarium e.V.*	SC GAS.2000 (a) (5)	6	The formulation "Static heaviness means the difference between airship mass and static lift" mixes units of mass and force.	Use or simply leave the definition of static heaviness from LFLS § 309 Design Weights (TAR 309 Design Mass) (a)(2) : "Static heaviness ~~means the difference between airship mass and static lift~~ **is the amount by which the weight of an airship exceeds the displacement buoyancy**"		x	noted	See EASA response comment #21
255	*Johannes Eissing* *Aerarium e.V.*	SC GAS.2000 (a) (9)	6	The current formulation is misleading: "Static lift or Buoyancy is the difference between the weight of air displaced by the airship and the weight of the lifting gas". Aerostatic lift is an external force and thus independent of the weight of the lifting gas. The formulation used here is equivalent to the term "unit lift" as used in LFLS § 2 Definitions (g) and TAR APPENDIX C (c). The current formulation would lead to neglecting the mass of the lifting gas, making a considerable contribution to the total masses, and thus to the inertia loads.	"Static lift or ~~Buoyancy~~ **displacement buoyancy** is ~~the difference between~~ **equivalent to** the weight of air displaced by the ~~airship and the weight of~~ the lifting gas."		x	noted	See EASA response comment #21
256	*Johannes Eissing* *Aerarium e.V.*	SC GAS.2370 all	22	The formulation "If a system is installed…" would mean section (a) and (b) could be neglected by just not installing a disposable ballast system. This would allow certifying airships not being capable of "maintaining equilibrium" (also known as "balloon-mode"). The capability of maintaining equilibrium, however, has a significant impact on safe operations and on functional hazard assessments.	"~~If a system is installed using in-flight disposable ballast, the following applies:~~"		x	not accepted	Designs without disposable ballast are feasible.
257	*Johannes Eissing* *Aerarium e.V.*	STRUCTURAL LOADS	14-15	Part Structural loads deviates significantly from equivalent parts in subpart C of LFLS and TAR. Snow loads, Jacking loads, fatigue, are not addressed. Maneuver- gust- masting- and landing conditions are not defined.		x		noted	LFLS and TAR were prescibtive certification specifications, the proposed special condition aims to be a high level objective set of requirements as outlined in explanatory note.
258	*Johannes Eissing* *Aerarium e.V.*	Subpart F	26-28	LFLS and TAR paragraph "1303 Flight and navigation instruments" is not addressed		x		noted	Flight and navigation instruments are addressed by SC GAS.2510
259	*FLWH*	SC GAS.2105(c)(1)	8	The subparagraph quoted is missing	Reference to be provided	Yes	No	accepted	See EASA response comment #44.
260	*FLWH*	SC GAS.2105(c)(1)	8	The "," used between "vectored" and "propulsive" may lead to different interpretations	We suggest to write entirely "vectored thrust and propulsive thrust"	Yes	No	not acceptedd	Not the vectored thrust and propulsive thrust is meant, but the propulsive part of a vectored thrust, if used
261	*FLWH*	SC GAS.2105(d)	8	Does "procedures" used in this paragraph refer to "the procedures that will be used to gather performance data" (our understanding in the first sentence), or "standard operational procedures that will be described in the AFM" (possible interpretation of the second sentence)? This would change the purpose of the requirement.	Further explain "procedures"	Yes	No	noted	In the end "Procedures" refer to both, see (e)
262	*FLWH*	SC GAS.2105(g)	9	This requirement does not detail how it is expected to present performance information for "various levels of turbulence". Additionnaly SC GAS.2190 "Flight in Rough Air" also indicates the information to be provided in the Flight Manual, in terms of procedure and limitations.	We propose to remain at high level, simplifying the wording into "Procedures and performance information of the airship must be established for combinations of mass and static heaviness and be incorporated in the AFM"	Yes	No	not accepted	This part is especially for operation in turbulences

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263	*FLWH*	SC GAS.2122(a)	10	The SC GAS quite homogeneously uses “critical loss of thrust” rather than “loss of critical engine”, allowing consideration to different types of propulsion. This is not the case in this subparagraph.	We propose to continue using “critical loss of thrust” in place of “failure of one or more critical engine(s)”	Yes	No	not accepted	As thrust might be dependant on electrical power generation, enigne is believed to be a better wording here.
264	*FLWH*	SC GAS.2122(b)	10	The usage of “Enroute Flight Path information must be provided to crew” is confusing, whether it means through relevant AFM procedures or in situ information displayed to the flight crew.	Proposal of rewording: ”in case of critical loss of thrust, the flight manual must provide performance data and procedures to establish a safe flight path”	Yes	No	not agreed	This is not defining the means, but the data to be provided
265	*FLWH*	SC GAS.2122(b)	10	We do not understand the rationale for positioning the second sentence of this subparagraph in SC GAS.2122 “Powerplant failure”.	Relocate the 2nd sentence in more adequate paragraphs	Yes	No	noted	Currently there is no complete split of information to be determined and information to be proivided
266	*FLWH*	SC GAS.2122(b)	10	Please provide clarifications on “Variation of mass due to fuel consumption […] need to be **computed**”. By who/what? If by the crew, it is an operational requirement. If by the airship itself, this requirement is too prescriptive for the SC GAS intent.	_	Yes	No	accepted	Wording amended, to be determined.
267	*FLWH*	SC GAS.2122(b)	10	“Variation of mass …due to snow and rain accumulation need to be **computed**”. The term “Computed” is not appropriate, considering feasibility.	To cover the intention, it may be required to provide the crew with procedures to evaluate the variation of mass due to snow and rain accumulations.	Yes	Yes	not accepted	It is necessary for the crew to know how to handle snow and rain accumulation. For that they need to have the necessary information
268	*FLWH*	SC GAS.2130	10	The first sentence of the requirement is not clearly worded.	Proposal of rewording: “The applicant must determine the following data, at critical combinations of flight phases within the operational limits and under wind limits:”	Yes	No	partially-accepted	See #237
269	*FLWH*	SC GAS.2130(b)	11	This requirement seems already covered by SC GAS 2105(d). Or does this requirement 2130(b) imply additional performance data not covered by 2105(d) for the landing phase?	SC-GAS.2130(b) to be deleted, if confirmed redundant	Yes	No	not accepted	2130 (b) is not redundant
270	*FLWH*	SC GAS.2130(d)	11	The wording of “balked landing conditions” should be clarified for each airships landing types and to cope with the mooring phase between flight and ground conditions. For instance, the landing may be interrupted prior to mooring or during the mooring attempt.	“Balked Landing for airships” definition should be provided	Yes	No	not accepted	The term “Balked Landing” covers any time from initiating landing until a complete secured rest of the aircraft
271	*FLWH*	SC GAS.2135(a)(6)	11	Please explain what “gas cell **levels**” means in that context and for rigid airships.	Complement the wording accordingly	Yes	No	accepted	See #240
272	*FLWH*	SC GAS.2145 + .2160	12	Introduction of the new wording “flight crew workload **prejudicial** to safe operation” is not clear about what it implies exactly.	We propose to replace “induce a crew workload prejudicial to safe operation “ by “impair the pilot's ability to read instruments or to control the airship”	Yes	No	partially-accepted	Prejudicial has been replaced.
273	*FLWH*	SC GAS.2160(d)	12	Requirement written twice	To be deleted	Yes	No	accepted	See EASA response comment #80
274	*FLWH*	SC GAS.2220	15	The requirement seems redundant with that specified in SC GAS.2210 (a).	SC GAS.2220 to be deleted and 2210 (a) enriched as needed (eg: transition between operating conditions)	Yes	No	accepted	SC GAS.2220 removed.
275	*FLWH*	SC GAS.2240 (a)	16	Incorrect reference of paragraph in “Instructions for Continued Airworthiness required by requirement .2630”	To be changed into “Instructions for Continued Airworthiness required by requirement .2625”.	Yes	No	accepted	Wording amended
276	*FLWH*	SC GAS.2380 (c)	22	Typo error on the word “mored”	To be replaced with “moored”	Yes	No	accepted	Wording amended

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277	*FLWH*	SC GAS.2415(a)	23	This requirement seems too prescriptive: - regarding the intent of SC GAS.2165, and, - for some types of airships.	We propose to reword it as: "The airship design must prevent foreseeable accumulation or shedding of ice or snow that adversely affect Propulsion System operation in those icing conditions for which certification is requested."	No	Yes	not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5 or SC VTOL) GAS.2165 requires the airship to exit inadvertent entry in icing conditions, which requires the protection of the propulsion system.
278	*FLWH*	SC GAS.2530(b)&(c)	27	Typo error, usage of "aircraft" instead of "airship" (twice)	To be replaced	Yes	No	not accepted	EASA text is intentional as written.
279	*FLWH*	SC GAS.2530(b)	27	Typo error, "rule" to be deleted	Reworded as "The position and anti-collision lights must have the intensities, flash rate, colours, fields of coverage, and other characteristics to provide sufficient time for another aircraft or airship to avoid a collision."	Yes	No	accepted	Wording amended, "The position and anti-collision lights rules must have the intensities…."
280	*FLWH*	SC GAS.2615	29, 30, 31	Typo error, usage of "aeroplane" instead of "airship" (5 times)	To be replaced	Yes	No	accepted	See EASA response comment #187
281	Hybrid Air Vehicles	Explanatory note	4	The document says "a 45 000 m3 non-rigid hybrid airship for up to 55 passengers ."	Please change to say "a 45 000 m^3 non-rigid hybrid airship for up to 100 passengers."	No	Yes	accepted	Wording amended.
282	Hybrid Air Vehicles	Explanatory note	4	The list of legacy codes does not include the 2013 FAA HCC (Hybrid Certification Criteria for Transport Category Hybrid Airships).	Please add HCC to the list of legacy codes.	Yes	No	accepted	Wording amended.
283	Hybrid Air Vehicles	Explanatory note	4	The document says "to protect people on the ground as well as crew on board."	We suggest that the sentence is changed to say "to protect people on the ground as well as occupants on board."	Yes	No	accepted	Wording amended.
284	Hybrid Air Vehicles	2105 Performance Data	8	The document says "and the particular flight condition specified in subparagraph ( )"	Please either correct or remove this reference.	Yes	No	accepted	See EASA response comment #44
285	Hybrid Air Vehicles	2120 Climb and Descent	10	The document says "the minimum rate of climb must be demonstrated with critical-loss of thrust ."	We suggest that the sentence is changed to say "a minimum rate of climb at sea level of at least 0.76 m/s (150 ft/min) must be demonstrated with loss of a critical engine or propulsor." We also suggest that (a)(1) is split into two subparagraphs: "all-engines-operating" with 300 ft/min "loss of a critical engine or propulsor" with 150 ft/min. *For loss of thrust, we raise the same comment and same solution several times throughout this CRD. To aid reading, we use a green highlight for these repetitions.*	No	Yes	not accepted	EASA text is intentional as written. The proposed amendments by the commenter is AMC and guidance material to the objective requirement.
286	Hybrid Air Vehicles	2122(a) Powerplant Failure	10	The document says "The airship must be capable of maintaining level flight and zero rate of descent following failure of one or more critical engine(s)."	We suggest that the sentence is changed to say "For airships with two engines or propulsors, the airship must be capable of maintaining level flight and zero rate of descent following failure of one critical engine or propulsor. For airships with three or more engines, the airship must be capable of maintaining level flight and zero rate of descent following loss of two engines or propulsors."	No	Yes	not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.

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287	Hybrid Air Vehicles	2122(b) Powerplant Failure	10	The document says “in case of critical loss of thrust , Enroute Flight Path information must be provided to crew.”	We suggest that the sentence is changed to say “Information must be provided to crew for the En-route Flight Path after the loss of a critical engine or propulsor. For airships with three or more engines or propulsors, information must also be provided for the loss of two engines or propulsors.”	No	Yes	not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.
288	Hybrid Air Vehicles	2130(c) Landing Data	11	The document says “The airspace volume after a critical loss of thrust on multi-engine airships must be published if different than with all engines operating.”	We suggest that the sentence is changed to say “For airships with three or more engines or propulsors, the airspace volume after failure of two engines or propulsors must be published if it is different from that with all engines and propulsors operating.”	No	Yes	not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.
289	Hybrid Air Vehicles	2135(b) Controllability	11	The document says “It shall be possible to make an emergency landing without assistance from ground personnel in the maximum surface wind speed in which operation is permitted with critical loss of thrust .”	We suggest that the sentence is changed to say “It shall be possible to make an emergency landing without assistance from ground personnel in the maximum surface wind speed in which operation is permitted after the loss of a critical engine or propulsor. For airships with three or more engines or propulsors, information must also be provided for the loss of two engines or propulsors.”	No	Yes	not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.
290	Hybrid Air Vehicles	2140(b) Trim	11	The document says “with a critical loss of thrust .”	We suggest that the subparagraph is changed to say “with the loss of a critical engine or propulsor. For airships with three or more engines or propulsors, information must also be provided for the loss of two engines or propulsors.”	No	Yes	not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.
291	Hybrid Air Vehicles	2145(a) Stability	11	The document says “…with consistent use of the thrust controls,…”	The correct wording is “…with consistent use of the thrust and lift controls,…”	No	Yes	accepted	Wording amended
292	Hybrid Air Vehicles	2160(c) and (d)	12	Same paragraph twice.	Remove one of the repeated paragraphs	Yes	No	accepted	See EASA response comment #44
293	Hybrid Air Vehicles	2160(e) Vibration, Buffeting, and High-Speed Characteristics	12	There is no requirement covering the gas cells of rigid airships.	Add a sub-paragraph “For rigid airships the crew must be enabled to determine the gas cell pressure(s). If the crew can control gas cell pressure(s) within limits, then improper use of the procedure and the controls must not damage the gas cell(s) or the structure attached to them.”	Yes	No	accepted	Wording amended
294	Hybrid Air Vehicles	2180(a) Maximum Wind Velocities	13	The document says “with a critical loss of thrust .”	We suggest that the subparagraph is changed to say “with the loss of a critical engine or propulsor. For airships with three or more engines or propulsors, information must also be provided for the loss of two engines or propulsors.”	No	Yes	not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.
295	Hybrid Air Vehicles	2330(a) Fire Protection in Designated Fire Zones	21	The phrase “capable of withstanding the effects of a fire” is ambiguous.	We suggest that the first part of (a) is changed to “Within or adjacent to designated fire zones, the items identified in (1) and (2) below which would be subjected to the effects of fire in the fire zone must be either constructed of fireproof material or shielded by fireproof material.”	No	Yes	not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.
296	Hybrid Air Vehicles	2360 Payload & baggage accommodation	22	The document says “The provisions for accommodating payload and baggage internal or external (external limited to no human payload) of the airship must:”	We request that this limitation is removed as it reduces the social and humanitarian potential of the airship. We have operational scenarios such as search and rescue where the operator might want to deploy boats with crews (this has been demonstrated by a Skyship airship) or to pick-up survivors.	No	Yes	not accepted	The current scope of the projects under certification do not include hoisting. Further considerations deferred.

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297	Hybrid Air Vehicles	2615 Installed systems and equipment for use by the flight crew	29 and 30	This paragraph uses the word aeroplane three times.	Replace with the word airship.	Yes	No	accepted	See EASA response comment #187
298	IMIEU	SC GAS.2125	10	"Loading and unloading" must include additional safety requirements: for emergency conditions when load-exchange need to be abord and/or emergency ballast and/or cargo realize	Include the suggested additional safety requirements	yes		not accepted	Additional safety requirements for ground operations are not part of the airworthiness requirements.
299	IMIEU	N/A	N/A	SC.GAS need to include special requirements for Airship intended to transport cargo by sling load operations (moving and positioning cargo, cargo containers, e.g.)	Include special requirements for : 1 Operations Flight Characteristic Demonstration 2 External-Load Attaching Means 3 Quick-Release Devices 4 Buoyancy control 5. Controllability and dynamic stability. 6. Center of gravity	yes		not accepted	The requested requirements are addressed through the objective requirement SC GAS.2370.
300	IMIEU	SC GAS.2115	10	Small addition to Section (4) of SC GAS.2115	the airspace volume required to clear obstacles by a 15 m (50-ft) margin must be determined.	yes		accepted	Wording amended
301	*Paul van Daalen*	2100/ 2120 (a)/ 2130 (a)		When measuring or requiring distances to or from the airship (e.g. take-of distance) or altitude above ground, a point of reference inside the ship is needed Question: 'Where is the airship?	Define airship reference point	no	yes	noted	EASA considers the definition of the reference point as part of the means of compliance with the objective requirement.
302	*Paul van Daalen*	2105 (d)/ 2135		Elevator handling procedures in light or heavy conditions. Awareness of wandering lift center.	amend	yes	no	not accepted	EASA believes this is covered by GAS.2135(a)(1)(6)
303	*Paul van Daalen*	2160 (d)		2160 (d) is a copy of (c)	delete or replace by relevant text	yes	no	accepted	See EASA response comment #80
304	*Paul van Daalen*	2215 (a) (4)		Negative lift is not mentioned.	amend	yes	no	noted	SC GAS.2215(a)(4) defines lift from the minimum to the maximum design lift, it is EASA's interpretation that the minimum can be negative.
305	*Paul van Daalen*	2310		Not only for airships intended to operate on water, but also for airships operating over water.	amend	yes	no	not accepted	It is EASA understanding that SC GAS.2310 is applicable for intended operations on water. 2315(a)(1) provides the means for safe evacuation in case of operations over water.
306	*Paul van Daalen*	2315		Doors and emergency exits must be operable with gondola or hull deformation.	amend	yes	no	noted	SC GAS.2315(a)(1) states "… conditions likely to occur following an emergency landing …", which also addresses deformations.
307	*Paul van Daalen*	2335/ 2430 (a) (2)/ 2515		Delete "for operations where the exposure to lightning is likely". This is likely everywhere.	amend	yes	no	not accepted	Existing EASA regulations use the same wording, exposure to lightning is depending on operation.
308	*Paul van Daalen*	2380		Suggest to consult: "Ground Handling of Large Airships" by Giles Camplin, New Generations Publishing, 2016.	n/a	no	no	noted	

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309	*Paul van Daalen*	2400 / 2430		Missing are loads that the propulsion unit introduces into the airship structure.		yes	no	not accepted	Loads introduced by the propulsion system are addressed by SC GAS.2225(e)
310	*Paul van Daalen*	2615, (b) (3), (d), (e)(1)(i), (h)(2)		Wrong kind of aircraft	Replace “aeroplane” by “Airship”.	yes	no	accepted	See EASA response comment #187
311	*Paul van Daalen*	General		Missing are: - Requirements for Electrical systems (NB voltages can deteriorate over large distances in the ship), - Avionics, - Gasbags, Ballonets.	amend	no	yes	not accepted	Electrical systems are addressed through SC GAS.2525(a) Avionics are addressed through SC GAS.2500 Gasbags are addressed through SC GAS.2300 Flight Control Systems and 2540 Pressurised System Elements
312	*R G Van Treuren*	SC GAS 2380 (c)	22	Typographical error: “Airship must be mored…”	Airship must be moored	suggestion		accepted	See EASA response comment #276
313	*R G Van Treuren*	2615	30	“…operation of the aeroplane…”	…operation of the airship…	suggestion		accepted	See EASA response comment #187
314	*R G Van Treuren*	2615 (3)	30	“…effects on the aeroplane…”	…effects on the airship…	suggestion		accepted	See EASA response comment #187
315	*R G Van Treuren*	2615 (2 d)	30	“…manual control of the aeroplane.”	…manual control of the airship.	suggestion		accepted	See EASA response comment #187
316	*R G Van Treuren*	2615 (e i)	30	“…or aeroplane system…”	…or airship system…	suggestion		accepted	See EASA response comment #187
317	*R G Van Treuren*	2615 (h 2)	31	“…to safely operate the aeroplane.”	…to safely operate the airship.	suggestion		accepted	See EASA response comment #187
318	*R G Van Treuren*	2111 (a)	9	“The stall characteristics (loss of aerodynamic lft) shall be investigated…”	“The stall characteristics (loss of aerodynamic lft, inability to control altitude using hull drag) shall be…”	suggestion	Airship can stall upwards	noted	Comment not clear.
319	*R G Van Treuren*	2122	10	“…zero rate of decent following failure of one or more critical engine(s).”	…zero rate of decent following loss of up to 50 percent of its design full power thrust.	suggestion	Twin aeroplane flies on one engine; airship might have ten	not accepted	It is up to the applicant to define the critical engine and critical number of propulsion units for the intended operation.
320	*R G Van Treuren*	2160	12	(c) and (d) are duplicates	Eliminate (d) and move up (e) to become (d)	suggestion		accepted	See EASA response comment #80
321	*R G Van Treuren*	2215 (a 5)	15	…including the effects due to superheat…	“including the effects due to superheat and negative superheat…	suggestion	OAT can reduce lift	not accepted	Effects of superheat will be evaluated, positive as well as negative.
322	*R G Van Treuren*	2249 (c)	16	“…high energy fragments from an uncontained engine or rotating machinery failure.”	“…high energy fragments from debris excelerated by propulsors, an uncontained engine or rotating machinery failure.”	suggestion	Such as: ice flung from props	not accepted	Wording is commonly used in certification requirements by various authorities.
323	*R G Van Treuren*	2335	21	“…protected against catastrophic effects of lighting.”	“…protected against catastrophic effects of lighting and component-to-component conductivity of airstream-accumulated charges.”	suggestion	Airship can make its own lightning	not accepted	Wording is commonly used in certification requirements by various authorities.
324	*R G Van Treuren*	2355 (b)	21	“If the lifting gas is toxic, irritant or flammable…”	“If the lifting gas is toxic, irritant, asphyxiant or flammable in breathable atmosphere…”	suggestion	At lift purity gas is inert	not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.
325	*R G Van Treuren*	2380	22	”… prevented from unintended movement or free flight.”	”… prevented from unintended movement or free flight in the event of breakaway.”	suggestion		not accepted	EASA text is intentional as written. The proposed changes are not in the style of an objective requirement.

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326	*STRATOSYST s.r.o.*	Explanatory note	4	We welcome the EASA's work on Special Condition SC GAS Gas Airships, especially the stated focus on manned airships and that unmanned designed are not sufficiently addressed by this proposal. We believe that not only unmanned designed will require different regulation, but also all airship-like and HAPS (High Altitude Pseudosatellite) operations in the higher airspace (e.g. in stratosphere) will require a vastly different set of rules stemming from different nature of operations in the higher airspace as well as from different atmospheric conditions in the higher airspace.	We request EASA to include in the Explanatory note that not only unmanned designed are not sufficiently addressed by this proposal, but also all airship-like and HAPS (High Altitude Pseudosatellite) operations in the higher airspace (e.g. in stratosphere) will require a vastly different set of rules stemming from different nature of operations in the higher airspace as well as from different atmospheric conditions in the higher airspace.	Suggestion	Substantive	not accepted	The explanatory note specifies "the authors believe it is applicable to all manned airships with non-pressurized crew or passenger compartments"
327	*Transport Canada – AARDD/NAC*	SC GAS.2000	6 of 32	Definitions seem limited. Does any other "standard" terminology, such as Max TO Weight, etc., need to be included where it is specific to airship design ?	---	Y	N	noted	EASA did not identify further definitions unique to airship design.
328	*Transport Canada – AARDD/NAC*	SC GAS.2105(a)	8 of 32	Humidity effects are included however icing effects – where flight in icing conditions is approved – seems to be missing	Consider including icing effect when flight in icing conditions is approved.	Y	N	noted	Flight in icing conditions is addressed by SC GAS.2165 and 2415
329	*Transport Canada – AARDD/NAC*	SC GAS.2105(e) and (f)	9 of 32	Atmospheric conditions seems vague. Is atmospheric conditions intended to be wide ranging including cloud, precipitation, icing, etc.	Perhaps atmospheric conditions needs to be defined or expanded upon in this section.	Y	N	noted	Wording is commonly used in certification requirements by various authorities. Conditions are intentionally open to not artificially limit operations. Specific conditions should be at the level of AMC.
330	*Transport Canada – AARDD/NAC*	SC GAS.2105(g)	9 of 32	These sentence seems to be missing "wind"	Suggest revising to "…turbulence and wind…"	Y	N	not accepted	SC GAS.2105(g) addresses flights in rough air, originates from TAR 261.
331	*Transport Canada – AARDD/NAC*	SC GAS.2113(b)	9 of 32	The sentence states if flight in icing conditions is required, however, the stall warning system should also function as intended if airship encoutners icing condtion inadvertently.	The sentence should address stall warning whether, or not, flight in icing conditions is required.	Y	N	partially-accepted	Wording amended, IFR operations included, to align with CS 23 philosophy of VFR operations.
332	*Transport Canada – AARDD/NAC*	SC GAS.2120(c)	10 of 32	The sentence only mentions climb and descent. The sentence should address all phases of flight throughout the approved flight envelope.	The sentence should be reworded to include all phases of flight including climb and descent.	Y	N	not accepted	SC GAS.2120(c) addresses climb and descent requirements, the gas cells are addressed as pressure system by 2540.
333	*Transport Canada – AARDD/NAC*	SC GAS.2145 Stability	11	This paragraph dicusses airship stability but only refers to the pitch and yaw axis. Considering the novel designs proposed for many of these new configurations, including hybrid designs, it is inappropriate to exclude the roll axis.	Include the roll axis in the requirement.	Suggestion	Objection	noted	The current proposed designs of conventional shape are considered stable in the roll axis.
334	*Transport Canada – AARDD/NAC*	SC GAS.2160 Vibration, Buffeting, and High-Speed Characteristics	12	Paragraph (c) is repeated twice, "Envelope or hull distortion and/or deflection…"	Delete second item.	Observation	Editorial	accepted	See EASA response comment #80
335	*Transport Canada – AARDD/NAC*	SC GAS.2155 Ground Handling Characteristics	12	The document does not elaborate on content or extent of ground handling procedures.	Consider whether more detail is required for airship related procedures like drag ropes, inflation, deflation, rip cords, etc… Wording from air balloon standards could be imported to the SC.	Suggestion	Substantive	noted	The details listed by the commenter are consider AMC for the following high level objective requirements SC GAS.2380 and 2620
336	*Transport Canada – AARDD/NAC*	SC GAS.2155(a)	12 of 32	The sentence only mentions wind conditions. Many environmental conditions can affect the ground handling activities.	The sentence should be revised to include all envirionmental conditions including wind.	Y	N	accepted	Wording amended

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337	*Transport Canada – AARDD/NAC*	SC GAS.2165 Flight in icing conditions	12	Does this section adequately capture the structural and centre of gravity impacts inherent with accumulating ice/snow on large airship surfaces? The additional mass can be significant.	Suggest that that an additional paragraph be included in section SC GAS.2200 Structural Design Envelope and SC GAS.2215 Flight Load Conditions(5) [with cross-reference within these subject sections] to explicitly identify the requirement. Consider whether it is also appropriate for mentioning in SC GAS.2100 Mass and Centre of Gravity.	Suggestion	Substantive	not accepted	EASA's intention was to develop high level objective requirements. In this respect GAS.6165 (a) addresses the concerns in terms of "can be safely operated" and (c) "the applicant must develop an operating limitation". In addition GAS.2215(a)(5) addressed environmental conditions. The particular concerns regarding increase in mass and potential shift in CoG will be addressed through means of compliance.
338	*Transport Canada – AARDD/NAC*	SC GAS.2165(a)	12 of 32	The sentence specifies characterisitics of icing conditions which are part of Appendix C icing conditions. It is expected that airships might operate in Appendix O icing conditions. Since the Appendices already exist, "…to be agreed with the Agency" seems overly vague.	The sentence should be revised to "…maximum conditions of Appendix C icing conditions. The sentence could also mention Appendix O icing conditions.	Y	N	not accepted	See EASA response comment #337. EASA considers references to Appendix C or O as means of compliance.
339	*Transport Canada – AARDD/NAC*	SC GAS.2165(b)	12 of 32	The sentence seems to address only those icing conditions for which the airship is not certified to operate in. There does not seem to be a sentence addressing ice detection systems to detect ice in icing conditions for which the airship is certified to operate in.	The first sentence should address ice detection systems detecting icing conditions for which the airship is certified to operate in. The second sentence could address those icing conditions not cerified.	Y	N	accepted	Wording amended
340	*Transport Canada – AARDD/NAC*	SC GAS.2165(d)	12 of 32	This sentence is similar to 2165(a) where the characterization of the environment is not specifically identified. Experience shows there are many descriptions of snow. If possible, a more specific reference to snow should be included.	----	Y	N	not accepted	See EASA response comment #337. Specific characteristics of precipitation are considered means of compliance.
341	*Transport Canada – AARDD/NAC*	SC GAS.2180 Maximum Wind Velocities	13	The maximum wind speed must be at least 10 kts and ~~for~~ shall not be greater than the lesser of	Delete extra word.	Observation	Editorial	accepted	See EASA response comment #82.
342	*Transport Canada – AARDD/NAC*	SC GAS.2250(e)	17 of 32	This sentence does not include any reference to the required indication system to the flight crew.	Add to this sentence "…and provide an active indication to the flight crew of their safe, or, unsafe condition prior and during flight."	Y	N	not accepted	Wording is commonly used in certification requirements by various authorities. The requirement originates from CS23.2250(e), the indication is considered means of compliance depending on the project specific design.
343	*Transport Canada – AARDD/NAC*	SUBPART D — DESIGN AND CONSTRUCTION	19	Balloon regulations have a requirement related to AWM 531.83 Conspicuity that may be applicable to this SC.	Consider including an equivalent statement. "The exterior surface of the envelope must be of a contrasting colour or colours so that it will be conspicuous during operation. However, multicoloured banners or streamers are acceptable if it can be shown that they are large enough, and there are enough of them of contrasting colour, to make the balloon conspicuous during flight."	Suggestion		not accepted	The conspicuity requirement has been removed in the development of the newest balloon regulations CS31-HB/GB/TGB, as considered given.
344	*Transport Canada – AARDD/NAC*	SUBPART D — DESIGN AND CONSTRUCTION	19	Balloon regulations have a requirement related to AWM 531.61 Static Discharge that may be applicable to this SC.	Consider including an equivalent statement. "Unless shown not to be necessary for safety, there must be appropriate bonding means in the design of each balloon using flammable gas as a lifting means to ensure that the effects of static discharges will not create a hazard."	Suggestion	Substantive	accepted	Paragraph SC GAS.2340 Electrostatic Discharge has been added.
345	*Transport Canada – AARDD/NAC*	SC GAS.2315	19 of 32	The sentence does not mention a minimum dimensional size for exits. In lieu of a specific dimension, it could be stated on a performance basis to address the 5th to 95th percentile range of occupants.	Add a point to say that exits must accommodate a range of occupants from the 5th to 95th percentile range of occupants.	Y	N	not accepted	See EASA response comment #337. EASA considers this level of detail as means of compliance.

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346	*Transport Canada – AARDD/NAC*	SC GAS.2320	20 of 32	This section does not address a requirement that the airship design must address adequate ventilation and temperature control systems for the occupants and to enable the crew to perform their duties.	Add a sentence to address the need for adequate ventilation and temperature control systems in the occupied areas and to enable the drew to perform their duties.	Y	N	not accepted	SC GAS.2600 (a) contains provisions to provide the flight crew with an adequate work environment. The explanatory note specifies the applicability to non-pressurized occupant compartments, therefore EASA considers the provisions of GAS.2320 sufficient. Specific environmental operating conditions are at the level of means of compliance.
347	*Transport Canada – AARDD/NAC*	SC GAS.2320	20 of 32	This sentence uses the terminology "…likely failures…" For consistent use of terminilogy, should "likely" be replaced by "probable" throughout the SC if this is what is intended in this SC.	Suggest replacing "likely" with "probable"	Y	N	not accepted	Wording is commonly used in certification requirements by various authorities. Wording is intentionally chosen to address the likeliness and not probability.
348	*Transport Canada – AARDD/NAC*	SC GAS.2325	20 of 32	The section is unclear if it applies to occupied areas only or unoccupied areas only or both. It may be assumed that it applies to any or only both. If the intent is that there is a difference, the wording could be revised to show which considerations need to be addressed for Fire Protection in Occupied or Unoccupied Areas.	Suggest splitting the section to address Occupied and Unoccupied Areas if there is a difference of intent in this section.	Y	N	not accepted	SC GAS.2325 addresses the fire protection for the entire airship as high level objective requirement, the associated means of compliance need to consider a proportionate approach for the various occupied and un-occupied areas.
349	*Transport Canada – AARDD/NAC*	SC GAS	----	Consistent use of terminology for apparently similar phrases is questioned. For example, in the SC, the use of the terms – "likely conditions", "expected conditions", "anticipated conditions", etc. seem to referto the same / similar condtions. There appears to be a need to standardize on terminology where necessary to ensure correct understanding.	Suggest standardizing on the use of specific phrases to ensure common understanding throughout the SC.	Y	N	noted	Further consideration deferred.
350	*Transport Canada – AARDD/NAC*	SC GAS.2360 Payload & baggage accommodation	22	Rotorcraft regulations have a requirement related to 529.865 External Loads, including both human and non-human cargo.	Considering the planned uses for future airship configurations include many cargo/heavy lift operations, similar standards to rotorcraft external loads should be incorporated in the SC.	Suggestion	Substantive	noted	EASA is also proposing rotorcraft requirements for hoisting as means of compliance to GAS.2370
351	*Transport Canada – AARDD/NAC*	SC GAS.2360	22 of 32	Leading sentence does not read well (internal or external appears to be misplaced) and intent of statement in brackets is unclear: are we forbidding external human payload, or just saying that these requirements do not apply to it?	**Option 1A:** If the intent is to forbid external human payload: Change to: "The provisions for accommodating internal or external payload (external human payload not permitted) and baggage must:" **Option 1B:** Same intent, but split the different requirements into different sections rather than try to include too much in one sentence: (a) The provisions for accommodating internal or external payload and baggage must: (1) Be designed … (b) No external human payload is permitted. **Option 2:** If the intent was not to forbid human external payload but to not apply these requirements to it, then change to: "The provisions for accommodating internal or external payload (other than human external payload) and baggage must:"	Y	N	noted	See EASA response comment #337. The intention is to forbid external human payload. Wording has been amended.
352	*Transport Canada – AARDD/NAC*	SC GAS.2360	22 of 32	Sub-paragraph (e) does not follow the structure of the sentence.	Change to: (e) For external payload, provide adequate means to enable…	Y	N	accepted	Wording amended

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353	*Transport Canada – AARDD/NAC*	SC GAS.2380	22 of 32	Sub-paragraph (a) does not read well. How does one "determine ancillary ground equipment"?	If I understood the intention, I would suggest that the requirement is complete without some parts: "The applicant must establish the performance, design requirements and procedures applicable to the ancillary ground equipment that ensure the safe operation of the airship."	Y	N	accepted	Wording amended
354	*Transport Canada – AARDD/NAC*	SC GAS.2380	22 of 32	Sub-paragraph (c) seems to indicate that an airship must always be moored…	"While moored, the airship must be prevented from unintended movement or free flight"	Y	N	accepted	Wording amended
355	*Transport Canada – AARDD/NAC*	SC GAS.2510 Equipment, Systems, and Installations	26	The structure of this section mimics the traditional 1309 philosophy. Is the intent also to follow the ARP guidance? Will there be an associated advisory document that accompanies this SC?	Need to clarify the level of analysis required with respect to system safety methodology.	Observation	Substantive	noted	EASA has issued CRI guidance following the ARP process. Means of compliance are at the moment project specific.
356	*Transport Canada – AARDD/NAC*	General		The proposed Special Condition forms a high level set of safety objectives and performance-based specifications. It is believed that it is EASA's intention to further detail acceptable means of compliance and criteria to assess compliance (ex.: quantifiable pass/fail criteria). Based on this belief, TCCA F&HMS will not comment on the perceived need to detail the specifications within SC-GAS-01 (which, in TCCA's F&HMS opinion, is necessary to form a full certification basis for large airships). TCCA F&HMS notes that, from the perspective of its disciplines (Fuel and Hydromechanical Systems), and excepting Operation after Cold Soak (ref.: AWM 52X-1309-1), the proposed Special Condition seems to encompass (albeit in high level) the safety considerations that our current knowledge of this type of product and associated operation allows us to think of.	TCCA F&HMS thanks EASA for the opportunity to comment on this Special Condition. We would welcome participating in further developments to the certification basis and means of compliance for large airships.	Observation	Substantive	noted	
357	*Transport Canada – AARTC/D*	Explanatory note	4	EASA states "…airships while ithas not …"	Revise to read "…airships while it has not…"	Yes	Yes	accepted	Wording amended
358	*Transport Canada – AARTC/D*	SC GAS.2000(a)	6	Font error on subparagraph (2).	Revise fonts.	Yes	Yes	accepted	Format corrected
359	*Transport Canada – AARTC/D*	SC GAS.2000(a)	6	In subparagraph (11), EASA states "… means the state of the following:"	Revise to read "… means any combination of the state of the following:"	Yes	Yes	accepted	Wording amended
360	*Transport Canada – AARTC/D*	SC GAS.2105(c)	8	In subparagraph (1), the subparagraph reference is missing.	Revise missing reference.	Yes	Yes	accepted	See EASA response comment #44
361	*Transport Canada – AARTC/D*	SC GAS.2110(c)	9	EASA states "… (see SC GAS.2111)"	Revise to read "… in accordance with SC GAS.2111"	Yes	Yes	accepted	Wording amended
362	*Transport Canada – AARTC/D*	SC GAS.2111	9	EASA states "… stall characteristics (loss of aerodynamic lift …"	Remove text in parentheses and define stall in GAS.2000.	Yes	Yes	noted	Further considerations deferred. Further guidance on stall characteristics may be provided under means of compliance.
363	*Transport Canada – AARTC/D*	SC GAS.2113(a)	9	The purpose of subparagraph (1) is unclear. Preceding requirements state the need to conduct stall demonstrations in certification but subparagraph (1) assumes that the airship may not stall.	Remove requirement or clarify intent.	Yes	Yes	noted	The Special Condition targets both traditional near equilibrium as well as hybrid statically heavy airships design concepts, and therefore addresses airships that might not experience stalls.

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364	*Transport Canada – AARTC/D*	SC GAS.2165(d)	12	It is unclear to the purpose of a snow envelope, in addition to flight in icing conditions. Is the concern with regards to snow buildup on the airship hull? Would this not be included in icing buildup demonstration already?	Remove requirement or clarify intent.	Yes	Yes	noted	EASA has a concern regarding the builup of snow, which might be different to ice due to the slow airspeeds.
365	*Transport Canada – AARTC/D*	SC GAS.2240(c)	16	EASA states “The airship… or rotating machinery failure.”	Revise to read "... machinery failure or of a fire originating inside the engine which burns through the engine case.”	Yes	Yes	not accepted	Wording originates from SC-VTOL and considers the full range of propulsion systems.
366	*Transport Canada – AARTC/D*	SC GAS.2300(a)	19	EASA states “…the effects of a fire:”	Revise to add “…the effects of a fire for 15 minutes:”	Yes	Yes	not accepted	The specific duration is considered means of compliance.
367	*Transport Canada – AARTC/D*	SC GAS.2300(a)	19	The intended barrier and penetrations at the fire zone interface should withstand the effects of a fire for 15 minutes	Revise to add in SG GAS.2300 (a) “(3) Any barrier and its penetrations that separates the powerplant from the rest of the airship.”	Yes	Yes	not accepted	GAS.2330(a)(1) “any system” includes the propulsion system, further addressees GAS2430 the specific propulsion installation requirements.
368	*Transport Canada – AARTC/D*	SC GAS.2300(c)	19	The terminals, equipment, and electrical cables used during emergency procedures may need to be more than fire-resistant depending on the type of installation and components such as an oil cooled electrical generator assembly which would have been qualified fireproof.	Revise to read in SG GAS.2300 (c) “(c) Terminals, equipment, and electrical cables used during emergency procedures must be at least fire-resistant.”	Yes	Yes	accepted	Wording amended
369	*Transport Canada – AARTC/D*	SC GAS.2355(a/b)	21	The lifting gas system should withstand loading conditions beyond just the expected operation as specified in subparagraph (a)(1) to include the emergency condition specified in SC GAS.2270. Contrary to paragraph (b), absence of the emergency condition design to the lifting gas system would jeopardize occupant safety.	Revise subparagraph (a)(1) to include emergency condition, in addition to loading conditions expected in operation.	Yes	Yes	accepted	Wording amended.
370	*Transport Canada – AARTC/D*	SC GAS.2355(b)	21	EASA states “… all envisaged ground and flight conditions.”	Define the critical ground and flight conditions for lifting gas flammability.	Yes	Yes	not accepted	Critical ground and flight conditions are considered means of compliance.
371	*Transport Canada – AARTC/D*	SC GAS.2405	23	EASA states “…the flight envelope of the airship:”	Revise to add “…the flight envelope of the airship and under all foreseeable operating conditions such as fire.”	Yes	Yes	accepted	Wording amended.
372	*Transport Canada – AARTC/D*	SC GAS.2435(a)	24	EASA states “…is to support the Propulsion System...”	Revise to add “…is to support all functions of the Propulsion System...”	Yes	Yes	noted	Comment is not clear, it is unclear which functions are considered under “all functions”
373	*Transport Canada – AARTC/D*	SC GAS.2435(b)	24	EASA states “…in the engine reliability.”	Revise to add “…in the engine reliability and be declared in the engine installation instructions.”	Yes	Yes	noted	Comment is unclear, installation instructions of the propulsion system are contained in EASA SC E-19
374	*Transport Canada – AARTC/D*	SC GAS.2435(d)	24	EASA states in (d) “Systems must be capable of operating under the conditions likely to occur.”	Define which systems. You mean "Propulsion support systems"?	Yes	Yes	accepted	Wording amended.
375	*Transport Canada – AARTC/D*	SC GAS.2435(e)	24	EASA states in (e) “System function and ….”	Define what is meant by “System”.	Yes	Yes	accepted	See EASA response comment #374
376	*Transport Canada – AARTC/D*	SC GAS.2435(g)	24	EASA states in (g) “… and be able to influence it.”	Define what is meant by “… and be able to influence it.”.	Yes	Yes	noted	The objective is for the flight crew to prevent for example icing.
377	*Transport Canada – AARTC/D*	SC GAS.2435(h)	24	EASA states in (h) “… critical loss of thrust must be mitigated.”	Change to read "must be prevented" in lieu of "must be mitigated".	Yes	Yes	not accepted	EASA considers mitigation as an acceptable means for an objective based requirement.
378	*Transport Canada – AARTC/D*	SC GAS.2500(b)	26	For SC GAS.2500(b), does the MOC include considerations for cybersecurity threats as possible sources of improper functioning of equipment and systems? If yes, is AMC 20-42 the accepted MOC with SC GAS.2500(b)?	EASA should identify applicable AMC	Yes	Yes	noted	As explained in the explanatory note, EASA intends to develop project specific means of compliance on a case by case basis.

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379	*Transport Canada – AARTC/D*	SC GAS.2500(b)	26	EASA states "…throughout the operating and…"	Revise to add "…throughout the foreseeable operating and…"	Yes	Yes	not accepted	The requirement addresses functions throughout the operating limits for which the airship is certificated.
380	*Transport Canada – AARTC/D*	SC GAS.2510(b)	26	EASA states "…throughout the operating and…"	Revise to add "…throughout the foreseeable operating and…"	Yes	Yes	not accepted	See EASA response comment #379
381	*Transport Canada – AARTC/D*	SC GAS.2515(b)	26	EASA states "…of the flight-crew to…"	Delete the dash in "flight-crew" throughout the SC to be consistent with other parts of the standard.	Yes	Yes	accepted	Wording amended
382	*Transport Canada – AARTC/D*	SC GAS.2600(b)	29	EASA states "…The system and equipment design…"	Revise to read "The systems and equipment design…"	Yes	Yes	accepted	Wording amended
383	*Transport Canada – AARTC/D*	SC GAS.2605(a)	29	The requirement of this paragraph is burdensome and unclear to its intent. "Each item of installed equipment … must be labelled" does not clearly contribute to safety and increases clutter in the flight panel.	Remove requirement or clarify intent.	Yes	Yes	partially-accepted	Requirement was reworded, "if applicable" was added to reflect wording of CS-23 amdt. 5 and avoid the risk identified by TCCA.
384	*Transport Canada – AARTC/D*	SC GAS.2615(b)	29	EASA states "…of the aeroplane from…"	Change "aeroplane" to read "airship" in several places throughout the SC document.	Yes	Yes	accepted	Wording amended
385	*VARIALIFT*	2100 (b)	8	Varialift has no Ballonets, and its gas cell pressure is always equal to the ambient air pressure.	Variable buoyancy apparatus should be added to text.	YES	NO	not accepted	EASA anticipates that the special condition will evolve overtime with further applications proposing variations in design. The current version only addresses traditional concepts.
386	*VARIALIFT*	2105 (b) (1)	8	Varialift may T/off and Land from any suitable flat sopace, no mooring required	Add mention of operating site, wether mooring or not required by design	YES	NO	not accepted	See EASA response comment #385
387	*VARIALIFT*	2105 (c) (1)	8	Varialift may rise simply from addition of lifting gas to cells, without propulsive thrust. Propulsive thrust will only be required to cancel windspeed to allow vertical rise	Add mention of where applicable…and also in case of non propulsuive thrust in caseof climbing and descending	YES	NO	not accepted	See EASA response comment #385
388	*VARIALIFT*	2110 (c)	9	Varialift does not need forward motion to generate lift at all. It is purely static. By definition it does not stall	Add where applicable. Not for Variable buoyancy only airships	YES	NO	noted	Individual paragraphs might not be applicable to certain design configurations e.g. stall for equilibrium airships.
389	*VARIALIFT*	2111	9	Not applicable for stall. But understanding effects on icing is impotant.	Add where applicable. Not For Non-stall airships	YES	NO	noted	See EASA response comment #388
390	*VARIALIFT*	2112	9	Idem		YES	NO	noted	See EASA response comment #388
391	*VARIALIFT*	2113 (a)	9	Varialift does not stall, but if a sudden loss of buoyancy occurs a warning alarm should be installed	Add text …stall or sudden loss of static buoyancy in case of non stall airships	YES	NO	not accepted	SC GAS.2113 addresses the stall warning, if the Varialift design demonstrates a stall behaviour under certain configurations, stall characteristics need to be investigated.
392	*VARIALIFT*	2115	10	As a true VTOL, no take off run required for Varialift	Add text in (4) … if applicable for non full VTOL airships where distance to clear obstacles (15m) (50ft) margin must be determined	YES	NO	noted	See EASA response comment #388
393	*VARIALIFT*	2120 (a), (b), (c)	10	(a) (1) As a VTOL without thrust, mention must be made of min performances without thrust. (b) Idem (c) Varialift gas cells are never above or below atmospheric pressure	Add perhaps where applicable, non thrust min performances in max climb and descent Add where gas cells pressures vary.	YES	NO	not accepted	The existing wording addresses minimum climb performance. Also c) requires gas cell pressure to remain within approved limits.
394	*VARIALIFT*	2122	10	Varialift remains on static lift in the event of partial or total engine failure		YES	NO	noted	

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395	*VARIALIFT*	2125	10	Varialift and is never masted. It either lands on the ground becomes heavier than air or is hovering (floating) with neutral buoyancy. Varialift does not need to load or unload ballast while on flight. Its Variable buoyancy compensating apparatus does this. It will cater for buoyancy changes during on flight loading and unloading of cargo		YES	NO	noted	
396	*VARIALIFT*	2130 (a)	10	As Varialift is a VTOL. Essentially a cylinder of a specific diameter to include safety to 15m will be provided		YES	NO	noted	
397	*VARIALIFT*	2140 (a),	11	Varialift's Varable buoyancy system operates in trim mode also	(a) Add mention of ..other trim system such as variable buoyancy trim	YES	NO	not accepted	EASA text is intentional as written. If future projects demonstrate trim systems, which are not sufficiently covered by this requirement an updated SC will be provided.
398	*VARIALIFT*	2160 (c)	12	Varialift's hull is all aluminium. It does not distort.		YES	NO	noted	
399	*VARIALIFT*	EXTRA		Varialift intends to add solar panneling to diverse levels adhered and/or attached to its aluminium Hull to generate electric power. At some point this should be included in the menion of structure/support and also in powerplant use as some electric motors may be used to generate thrust at some future date.		YES	NO	noted	
400	*A. Brauchle* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2350	21	The airship envelope or hull and its connecting structure must: (a) withstand all loading conditions expected in operation to maintain aerodynamic shape Semi-rigid airship could operate with zero hull pressure in abnormal situations.	The airship envelope or hull and its connecting structure must: (a) withstand all loading conditions expected in **normal** operation to maintain aerodynamic shape	no	yes	accepted	Wording amended.
401	*A. Brauchle* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2530	27	(d) Any additional lights required for night operations, such as landing lights, must be installed on both airship and ground equipment To imperative.	d) Any additional lights required for night operations, such as landing lights, **should** be installed on both airship and ground equipment	no	yes	not accepted	EASA text is intentional as written.

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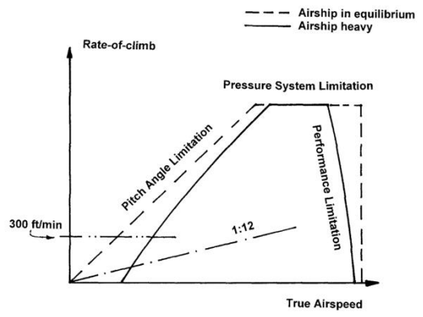
402	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2000 (a)(7)ii	6	The definition of VCD does not make sense. VH is usually achieved with the airship in aerostatic equilibrium (EQ). For a statically heavy airship, the maximum airspeed obtainable in a climb will be lower than in level flight, so VCD cannot be greater than VH. For most conventional airships with their moderate static heaviness range, the airship will also be slower in a dive with positive heaviness due to the additional lift dependent drag than in level flight in EQ. So, again, it is unlikely that VCD is higher than VH. This brings us to another issue with VCD. Over a large range of static heaviness values, the climp rate is independent of engine thrust, but is limited by system performance values (i. e. by the outflow capacity of air valves in pressure type airships or of outflow openings in pressureless airships) or by pitch angle limitations imposed elsewhere under SC GAS. If VCD shall be the airspeed for best climb or descent, the requirement for maximum continuous power does not make sense. 	Omit VCD or change to another definition, if a VCD is actually required, i.e. "VCD is the maximum airspeed achievable in any flight condition" This would then make sense also for SC GAS.2215 (b)	no	yes	accepted	Wording amended.
403	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2100 (d)	8	To be able to determine the static heaviness at „any time" means that some device/system is available that determines the heaviness. This would prevent a determination of the heaviness by „in-flight weigh-off". On the other hand, a requirement for means to determine the trim state is missing.	"The flight crew must be able to determine, with sufficient accuracy to control the airship, the static heaviness and trim of the airship."	no	yes	accepted	Wording amended.
404	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2110	9	Not every kind of gas airship will stall in a classical sense (loss in aerodynamic lift), especially when the static heaviness is small compared to the aerostatic lift. It is possible to produce aerodynamic lift up to 90° angle of attack for a conventional body of revolution. What is sometimes mis-interpreted as a stall is in fact a phenomenom called „elevator reversal", when the elevator is no longer able to provide enough pitch-up moment to produce the pitch angle required. This kind of behaviour is only present in airships with a low CoG and high pitch stability.	Preclude the text with: "If the airship may stall: (followed by requirements (a) and (b)" This would then also be in-line with SC GAS.2113	no	yes	accepted	Wording amended.
405	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2120 (b)	10	For most parts of the flight envelope of most airships, the maximum climb and descent rates are determined by system limitations (i. e. valve outflow, blower performance, etc.), not by propulsive thrust. See scetch above under ZLT comment to SC GAS.2000 (a)(7)ii	It s suggested to change the requirement as follows: (b) The maximum rate of climb and descent envelope, to be used for all operations, must be established for all possible airship flight conditions.	no	yes	accepted	Wording amended.

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406	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2135 (b)	11	This is a very hard requirement for an „emergency“ and exceeds similar requirements for other types of aircraft. The survival of the occupants is top priority here and not the survival of the airship. So, how shall this be demonstrated during certification flight tests? It is suggested to omit the wind requirement here	Omit “...in the maximum surface wind speed in which operation is permitted...”	no	yes	accepted	Wording amended
407	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2140 (a)	11	How shall someone trim an airship with the trim system failed?	It should be possible to control the airship with the trim system failed and land it safely.	no	yes	accepted	Wording amended.
408	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2180	13	Text as written means “it must be lower than...”	Should the text not better read „The maximum wind speed must be at least 10 kts and **need not** be greater than the lesser of:“	yes	no	accepted	Wording amended, see EASA response comment #243
409	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2215 (a)(2)	15	The term “mass” is not well defined in airships. The mass of an airship in equilibrium is its volume times the local air density, so the “mass” depends on temperature and air pressure. From a loads perspective the above defined “mass” is only of minor importance. The “weighable” masses (without internal gases) and their distribution are more important, especially for non-rigids airships.	It may be left to the Means of Compliance to define “mass” further for an individual project.	yes	no	noted	Draft CS30T.25 and 30T.29 are considered acceptable means of compliance to define mass
410	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2215 (b)	15	See our comment for VCD under SC GAS.2000 (a)(7)ii		yes	no	noted	See EASA response comment #402
411	*J. Fecher* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2245 (a)	16	For an envelope on a rigid airship, it will be difficult to properly define what “flutter” actually is. Is a travelling wave or a standing wave of small amplitude already “flutter”?	Add “...must be free from **catastrophic** flutter...”	yes	no	accepted	Wording amended to state “free from unsafe flutter characteristics”
412	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2210 (c)	14	The formulation is not well chosen…any distribution of loads is based on physical principles. Applicant should also be allowed to determine the magnitude and distribution by tests or a combination of “physical principle” and test	Change to “the magnitude and distribution of these loads must be **determined** based on established physical principles, **or tests, or a combination of both,** within the structural design envelope.”	yes	no	not accepted	EASA text is intentional as written. (Reference CS-23 amdt. 5)
413	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2220	15	Include jacking loads, and loads, when the airship is suspended, i.e. from the hangar roof with lifting gas removed, for maintenance.	Add “…including when the airship is moored, **or jacked, or suspended** must be determined.”	yes	no	not accepted	Jacking or suspension loads are considered to be addressed by SC GAS.2200(g)
414	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2250 (f)	16	In-service operation shows no evidence of likelihood of birds strikes with airships. Many airships are slower than most birds, and they are large enough to be detected by birds. The applicant shall choose to design to a likely bird strike survival, or prove by other means, that a bird strike is extremely remote.	Add “Unless demonstrated by experience or test, that a bird strike leading to a catastrophic event is extremely remote, the airship must be designed to ensure…”	no	yes	not accepted	EASA text is intentional as written. EASA expects that an applicant addresses a possible bird impact at least in the FHA.
415	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2310 (b)	19	The failure of the critical element must be taken into account.	Change to “and account for the case of failure or flooding of the **critical** element of the buoyancy system.”	no	yes	accepted	Wording amended.

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NR	Author	Section, table, figure	Page						
416	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2335	21	It is not ensured, that atmospheric conditions which lead to lightning or static discharge, can be safely predicted, to make sure that the airship is never subjected to a lightning strike/static discharge, in flight or when mooring outside a hangar. Thus, the effect of lightning/static discharge should always be taken into account.	Change to "The airship must be protected against catastrophic effects of lightning.."	no	yes	accepted	Wording amended, to reflect the requirement of draft CS30T.581
417	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2370 (b)(2)	22	In airships, where (petrol) fuel could be dumped in an emergency, this fuel could be considered a ballast. Dumping it would be prohibited by that paragraph, though it could avoid a catastrophic loss of the airship. This should be cleared in a separate paragraph.	Add "c) paragraph (b)(2) is not applicable to an emergency dump of fuel to prevent a potential hazardous or catastrophic situation."	yes	no	partially-accepted	Wording amended to clarify the requirement is intended for normal operations, fuel dumping could be for emergencies only.
418	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2400 (b)	23	The applicant shall be provided with the possibility to prove the safety and soundness of the engine, propeller or APU by a combination of ground and flight tests, if can be demonstrated, that a loss of the critical engine, propeller, or APU does not lead to a catastrophic event.		yes	no	noted	EASA text is intentional as written. (Reference CS-23 amdt. 5) The propulsion product will be approved separately for example using SC E-19.
419	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2430 (b)(2)	24	See Nr 17	Remove "unless it is shown that exposure to lightning is unlikely"	no	yes	accepted	See EASA response comment #416
420	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2435 (g)	25	Only applicable to engines with variable/controllable air intake	Add "If the engine air intake is movable/changeable, the flight crew…"	yes	no	not acceptable	The requirement is not applicable to propulsion systems without variable/controllable air intake.
421	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2515	26	See Nr 17: A Lightning strike should be assumed to be not unlikely	Remove all wording that relates to a lightning strike being unlikely	no	yes	accepted	See EASA response comment #416
422	*S.Schaeufele* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2135 (c)	11	Too demanding. The build-up of rain droplets degrades any aerodynamic surface and hence an adverse effect of precipitation on control can occur, and is manageable up to a certain degree. Same applies to slight shifts in CG due to un-even distribution of precipitation on the airship.	Change to "In-flight accumulation of precipitation on the airship must not result significant change of control behaviour. Maintaining control in this situation must not require exceptional piloting skills."	no	yes	accepted	Wording amended
423	*K.Steinlein* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2122 (b)	10	Does this mean that single engine airships are not allowed to be built?		yes	no	noted	No the intention is not to limit potential designs, single engine designs are acceptable. However please note that the scope of this SC addresses large transport category airships, which are defined per the TAR as multi engine. It would be up to the certification team to complement or amend the certification basis for an individual project.
424	*K.Steinlein* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2160 (c) and (d)	12	Subsections (c) and (d) are identical	Omit one of them	yes	no	accepted	See EASA response comment #80
425	*K.Steinlein* *ZLT Zeppelin Luftschifftechnik*	SC GAS.2350 (a)	21	It is possible for certain types of airships (i.e certain pressure-type airships with internal structure) to continue safe flight at low airspeed pressure-less and thus without maintaining its aerodynamic shape.		yes	no	noted	

* Please complete this column using the word "yes" or "no"
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