Comment-Response Document 2016-17

Appendix
to ED Decision 2017/014/R

RELATED NPA 2016-17 — RMT.0690 — 30.3.2017

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1. Summary of the outcome of the consultation

During the NPA 2016-17 consultation, 156 comments from 35 stakeholders were received.

The list of stakeholders commenting on NPA 2013-07 included national aviation authorities (NAAs), type certificate holders (TCHs), general aviation (GA) associations, manufacturers of parts and appliances, aircraft owners, and others.

The nature of the comments received ranges from specific technical aspects, to comments aiming to improve the wording of the proposed amendments.

Several comments were accepted or partially accepted, thus leading to substantial amendments of the proposed text which, in certain elements, has been significantly improved.

A summary of the comments that EASA wants to highlight is provided here after.

The list of individual comments received, and the responses thereto, is provided in the Chapter 2.

- Differences between CS-STAN and FAA AC-43 'Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair'

  Some commentators asked for a complete transposition of FAA AC 43-13 into CS-STAN.

  Easa clarified that a full synchronisation with FAA AC 43-13 is not possible due to different administrative processes to be followed for the approval of changes and repairs.

  The substantial difference is that t CS-STAN provisions can be used to perform changes and repairs without a conventional approval process while in the US regulation framework the FAA approval is needed.

  EASA has already included in CS-STAN the element of FAA AC 43-13 which posed the lower risks, additional elements may be transposed to CS-STAN in the future.

- Release to service by pilot owner

  Some commentators asked to increase the number of tasks which can be performed by pilot owners sometimes referring to the provisions already included in Appendix VIII of Part-M.

  In general, EASA considers that the release by trained and qualified persons (i.e. Part-66 Licence Holder) is an appropriate means to maintain an acceptable level of safety, when changes and repairs made i.a.w. CS-STAN.

  Additionally, it should be considered that the provisions of Appendix VIII of Part-M refer to the execution of simple maintenance tasks in accordance with the published detailed maintenance instructions applicable to the aircraft.

  In many cases, CS-STAN requires specific considerations to be performed by qualified persons for which the pilot owners may not necessarily be in position to do them.

  However, if safety considerations would allow it, the possibility to perform the release to service has been extended to pilot owners (e.g. CS-SC034a exchange of existing battery by lithium iron phosphate batteries).

- Overlap between CS-SC052 and CS-SC057

Many commentators stated that the proposed CS-SC057 was partially overlapping the existing CS-SC052 without clear indications of the specific differences and related benefit.

EASA concurred with this position and decided to delete the proposed CS-SC057 and introduced the content into the scope of CS-SC052.

- Substantial change of CS-SR804 'use of alternative adhesive for repairs of wood and wooden mixed structures'

  Many commentators submitted comments and proposals for improvement of this new Standard Repair. EASA investigated the technical background of these comments and concurred with the opportunity to improve the initial text. This Standard Repair is no longer limited to epoxy resin adhesive.

- Clarifications on ETSO/JTSO/TSO references, this covers also SCs which were not included in the NPA

  Some stakeholders commented on the incomplete references to ETSO authorised equipment.

  EASA agreed on a more precise identification of the ETSO reference, where required and as part of the acceptable methods, techniques, and practices to embody a Standard Change.

  ETSO references have been clarified where needed. This adjustment has been extended also to Standard Changes that were not included in the NPA.

  Hereafter a list of Standard Changes which are amended with the aim to provide the precise ETSO reference:

  - CS-SC003a
  - CS-SC031a
  - CS-SC053a
  - CS-SC054a
  - CS-SC055a
  - CS-SC056a
  - CS-SC101a
  - CS-SC153a

  Additionally, the general ETSO reference has been removed from CS-SC033a and from CS-SC102a because there is no dedicated ETSO available.

- Acceptance of FAA STC by means of CS-STAN

  Some stakeholders proposed to establish new provisions in the CS-STAN in order to allow for the acceptance of FAA STCs on general aviation aircraft without the need of a formal application of the US STC holder.

  The automatic acceptance of the FAA STC needs to be defined in the bilateral between the US and the EU. Legally it cannot be part of CS-STAN.

- Proposals for new standard changes/repairs

  Some stakeholders submitted comments asking for new Standard Changes or Standard Repairs to be added in the CS-STAN. Those have been collected and will be investigated during the process for the next amendment of CS-STAN.

To support the identification of possible improvements to CS-STAN and to support its future evolution, EASA would appreciate stakeholders' voluntary feedback on embodied CS-STAN Changes or Repairs and new proposals, using the new reporting system introduced by CS-STAN — Issue 2.

As an alternative proposal, new Standard Changes and Standard Repairs can be submitted through the standard rulemaking proposal tool[1].

The submittal of proposals with complete and mature contents will clearly facilitate consideration for adoption in CS-STAN.

[1] https://www.easa.europa.eu/document-library/rulemaking-programmes/rulemaking-proposal

2. Individual comments and responses

In responding to comments, a standard terminology has been applied to attest EASA's position. This terminology is as follows:

(a) **Accepted** — EASA agrees with the comment and any proposed amendment is wholly transferred to the revised text.

(b) **Partially accepted** — EASA either agrees partially with the comment, or agrees with it but the proposed amendment is only partially transferred to the revised text.

(c) **Noted** — EASA acknowledges the comment but no change to the existing text is considered necessary.

(d) **Not accepted** — The comment or proposed amendment is not shared by EASA.

(General Comments)	-

comment	*11* comment by: *Samionics / General Aviation Avionics* The introduction of EASA CS-STAN was very much appreciated both by us (avionics installers) and our customers. All our installations during the past year have been done using CS-STAN or other approved means (existing minor changes and/or STC). Thanks to all staff at EASA that has been working hard with the development of CS-STAN. /Sam
response	Noted.

comment	*37* comment by: *UK CAA* Thank you for the opportunity to comment on NPA 2016-17, Regular update of certification specifications for standard changes and standard repairs (CS-STAN). Please be advised that there are no comments from the UK Civil Aviation Authority.
response	Noted

comment	*39* comment by: *Swedish Transport Agency Civil Aviation Department* Please be advised that the STA supports the update of CS-STAN and do not have any further comments on NPA 2016-17.
response	Noted.

comment	*46* comment by: *ECOGAS* **ECOGAS, European Council of GA Support, is representing SME's mainly but not only in maintenance.**

It would have been highly appreciated to make an impact assessment before changing the regulation. By following AC43 before EASA allowed MRO's to do much more then with the present CS STAN.
Of course we appreciate the effort, but it remains very limited unless it will one distant day covering really every possible action one cold think of and which are within the competence of MRO's.

The question remains: is the choosen CS-STAN approach really the right approach and will it be user friendly at the end or will it suffer from complexity ?

Ideally there would be no gaps left to what a competent MRO can do and it would cover everything in full which is, or better was covered, under AC43.13 for European MRO's.

We appreciate that more and more is referenced to **FAA AC 43** and the list of tasks allowed get longer. We wish it will be **fully synchronised** in the not to distant future.

The tendency, that Pilot owners can do more and more is justified when the competence is available, and this may be the case- but far from always. If the main intent is to allow non mechanical licensed staff (Pilots) to do more, then the list must become very detailed and very prescriptive and unmistakably clear, but this will become an very extensive and eventually unhandy document.

Before EASA properly certified SME's decided based on good training, judgement and vast mechanical experience how far they wanted to go and how they could apply AC43 to it's full limit. Even with the rowing list of task now in CS Stan, what competent SME's are allowed to do falls SHORT BY MUCH compared to their FAA counterparts AND falls EXTREMELY short of what they did before.

The effort in licensing their staff and their organisations by getting all the required permissions for their work is not honored appropriately.

SME's did not win in this exercise.

SME's would become winners if they could use AC43 within the limits of their own and competent decision making, as their FAA counterparts can. Especially to take into account that many EU countries, mainly those with a good vocational basic formation, have the competence within their staff and within their leader- or ownership.

Considering this it's unfair not to promote to use their competencies to the fullest for certified MRO-SME's. We hope that EASA is expanding in this direction, to emphasize and honour the strength and effort going into licensing their staff and aquiring the necessary approvals for MRO/SME's.

response

Noted.
Full synchronisation with FAA AC is not possible due to the different administrative processes to be followed for the approval of changes and repairs.

comment

56 comment by: *Luftfahrt-Bundesamt*

LBA comment

Equipment qualification:
The introduction part of any DO-160 chapter should be used to identify the minimum equipment qualification necessary for installation on board of an aircraft.
OEM (original equipment manufacturer) declaration should be only accepted when issued under an industry accepted quality system. Advertising data sheets with the note: ”parameters subject to changes without further notice” are not acceptable. Such data need to be recorded.
All ETSO references should be replaced by J/E/TSO if affected rules are available.

response

Partially accepted.
Consideration of DO-160, in the context of Standard Changes, would impose compliance demonstration activities which are not foreseen for CS-STAN. The installer needs to show the appropriateness of the installed equipment but not necessarily to DO-160.
EASA agrees to introduce the complete ETSO reference wherever applicable. This has also been extended to Standard Changes that were not included in the NPA.
Please refer also to the response to comment #138

comment *57* comment by: *DGAC France*

DGAC France appreciates this first CS-STAN revision proposal and thanks the Agency for providing regular modifications adding new standard changes (SC) and standard repairs (SR) and improvements/clarifications to existing ones.
DGAC France would have appreciated if this first revision of CS-STAN could have allowed to extend the eligibility of some of the first CS/CR to aeroplanes up to 5700kg, which is the limit to 21.A.90B and 21A.431B scope. DGAC had already provided EASA with this comment for the first issue of CS-STAN. The reason why this scope extension has still not been proposed is not understood.

response

Noted.
The implementation of CS-STAN is intended to progress on a step-by-step basis starting from the lower end of General Aviation. At this stage EASA considers the extension to larger aircraft (as defined by 21.A.90B and 21A.431B) as premature.

comment *87* comment by: *The Norwegian Air Sports Federation*

The Norwegian Air Sports Federation (NLF – Norges Luftsportforbund) applauds the extension of CS-STAN as proposed in NPA 2016-17. We support the general principles behind the proposal, as it enables the more wide-spread use of modern safety-enhancing technology in general aviation.

However, we are disappointed that a number of proposed extensions are still not in place. We believe that CS-STAN should be rolled-out more aggressively to include other types of modifications, including:

1. Minor modifications in the strict sense of the word, which for some reason are still missing, e.g. ski add-ons to landplane undercarriages and alternative aircraft starter batteries.
2. Modifications that could be regarded as being in the grey area between “major” and “minor”, but where there is legacy and successful history from European member states, e.g. the possibility to use alternative fixed-pitch wooden propellers without

an STC or inclusion in the TC, as practiced by Luftfahrt-Bundesamt in Germany.

3. Modifications based on unilateral acceptance of foreign supplemental type certificates, i.e. FAA STCs. The “basic STC” approach as laid out in US-EU TIP revision 5 has a number of limitations, which basically bars the avergae general aviation aircraft owner in the EU to benefit from it. Using CS-STAN as a vehicle to roll out FAA STCs for the light aircraft segment in Europe can quickly and efficiently introduce safety-enhancing technologies such as seat belts with airbags.

response

Not accepted.
Please refer to the response to comment #89

comment

129 comment by: *Austro Control*

Dear all,
please be informed that Austria supports NPA 2016-17.

Below you can find some comments:
There are a list of additional technical Items which should be included in CS-STAN.

Example: Use of alternate epoxy resigns for repair of GFRP sailplanes
or qualification of wood in aircraft repairs

Specific comment toSCS-SR804a

"use of composite adhesives for minor repairs of wood and wooden structure"

1) Structural Adhesives that complying with EN 301-I-90-GF-1,5-M could be used without any restriction.

2) The procedures of application and use as well as the restrictions given by the adhesive manufacturer in the specification and instruction are mandatory to be followed.

3) Epoxy bonding has very positive effects in areas were a constant pressure and precise gap could not be maintained, but is seems that at that time it cannot meet the requirements of EN 301. Therefore Epoxy adhesives should not be used for primary structural components such as spars, stringers main ribs, main frames. But could be used for standard ribs, standard frames, planking and covering.

4) All Epoxy bonded areas shall be limited to 50°C operating temperature and therefore colored white and not used in hot areas such as engine compartment.

5) The Epoxy Adhesive shall only be used when defined and tested by the manufacturer for wood bonding, Self mixing of Epoxy lamination resigns/hardener with different kind of filler does not produce a constant reproducible quality and is questionable in continuing airworthiness. Well Known Adhesives are T-88 und FPL-16A but shall not limited tot hat tipes as long as the manufacturer released the adhesive for structural wood bonding. The adhesive used shall be recorded in the maintenance report. Parallel bonding tests of each mixture shall be carried out.

6) Deviations from that limitations as well as for bonding to hardwood should be handled by

	individual Change approval and not by an CS-STAN change.
response	Accepted. This Standard Repair has been substantially amended taking in to consideration comments received from stakeholders. 1) Accepted, the standard repair is no longer referring to epoxy adhesive. Structural Adhesives complying with EN 301-I-90-GF-1,5-M have been added 2) Accepted, this requirement has been added to the SR 3) Accepted, specific limitation for epoxy has been added 4) Accepted, limitation has been added 5) Accepted, limitation has been added 6) Accepted, deviations from SR limitations and provisions cannot be handled as Standard Repairs

comment *135* comment by: *Airbus Helicopters*

The first issue of CS-STAN results from an initial consultation in 2014 (NPA 2014-24).

The standard changes or standard repairs initially proposed in NPA 2014-24 were mostly applicable to 'other-than-complex' aeroplanes (sometimes with maximum cruising speed under 250 kts), ELA2, which includes VLR (Very Light Rotorcrafts) and sometimes to specific categories of aircrafts (e.g. gliders).

Following comments received from various stakeholders, EASA has finally extended the scope of a significant number of standard changes to most "other-than-complex" rotorcrafts and therefore published a first issue of CS-STAN far away from the NPA proposal, without any further consultation or workshop.

Our opinion is that, even though Part-27 rotorcrafts are in principle eligible to standard changes or standard repairs according to the provisions in Part-21, such extensions should be done with extreme care.

Especially, there is little commonality between a glider or light Part-23 aeroplane and a Part-27 rotorcraft.

Light leisure aircrafts (gliders, light aeroplanes, VLR):

- Do not fly IFR,
- Have generally standalone instruments which can be exchanged without significant risks (and especially without risk of interference with other installed instruments)
- Are not used in a commercial context,
- Are generally maintained in close vicinity to the user, making a clear responsibility chain.

On the contrary, Part-27 rotorcrafts:

- May be certified for IFR,
- May include complex interconnected avionics systems,
- May be used for commercial air transportation,

- May be maintained by third parties.

Moreover, rotorcraft specificities need to be considered. Especially, losing an object external to a rotorcraft, due to inadequate fixations, resonance, icing ... may induce catastrophic consequences if the object hurts, for example, the tail rotor.

We agree on the general concept of standard changes / repairs as a way to reduce the burden and economic pressure on General Aviation. However, having the same considerations from ELA1 aircrafts to the top end of Part-27 rotorcrafts used in commercial air transport is not consistent with the proportionality concept currently pushed by all stakeholders.

Suggestions
No Part-27 rotorcraft manufacturer had commented on NPA 2014-24, the reason being very likely that Part-27 rotorcrafts were not eligible for any of the proposed standard changes or standard repairs. This was at least the reason why Airbus Helicopters had not commented.

We consider that the extension of the concept to Part-27 rotorcrafts should be shared with manufacturers, in order to assess:

- Which standard changes should be eligible to Part-27 rotorcrafts,
- Which limitations should be considered (e.g. not for IFR, not for CAT, ...),
- Which complementary recommendations should be provided to installers of standard changes, especially to ensure the lack of side effects of their installations on the pre-existing aircraft installations.

In this respect, **we suggest EASA to organize a workshop** where specialists of each area could bring their positions on the above items for each of the standard change either already defined in CS-STAN or proposed in the present NPA.

Some first recommendations (to be refined and completed) are:

- Restrict to VFR day operations the standard changes bearing on radio-communication or navigation systems, if not already restricted, because a complete loss of radio-communication and navigation systems which might result from an undesired side effect would be classified catastrophic in IFR and hazardous in night VFR; the concerned standard changes are typically CS-SC001, CS-SC003, CS-SC053, CS-SC054, CS-SC055, CS-SC056,
- For installations outside the aircraft, one should insist on the precautions needed to ensure the lack of mechanical interference with other equipment, structure or mechanics, either due to inadequate position of the installed equipment, inadequate binding, vibratory resonance or other effects like icing; especially interferences with the tail rotor may have catastrophic consequences for rotorcrafts; the concerned standard changes are typically CS-SC004 and CS-SC031,
- Also, installations on composite materials may require special procedures to avoid subsequent damage (debonding / delamination, water intrusion, ...),
- Add, whenever missing, considerations about possible electromagnetic interferences; especially, LEDs may generate notable RF noise which might impact electronic instruments and there is no specific instruction in that case (see CS-SC031 and CS-SC033),

- More generally, analyse more deeply the possible side effects of new or updated installations on the other parts of the product and add adequate considerations,
- Examine whether there is a means to precisely assess whether seats are dynamically tested seats or not and precisely describe this means in CS-SC152 and CS-SC153,
- Reconsider requirements expressed in general statements, like "*The antenna is located in a distance to other antennas appropriate for the aircraft and the antennas*", which are strictly unverifiable,
- Avoid relying too much on instructions and tests defined by the equipment manufacturer which, although they need to be followed, may not reveal sufficient to ensure the correct integration of the equipment in the aircraft, simply because the equipment manufacturer is missing information on the installation context,

We also suggest that future updates of CS-STAN should go through a **rulemaking task with a working group**, including among others representatives from aircraft manufacturers.

response

Partially accepted.
After the introduction of the CS-STAN through NPA 2014-04, a considerable amount of comments were received aiming at enlarging the scope of this code by extending the applicability of certain changes to the CS-27 helicopters as foreseen by Part 21.A.90B. In principle, EASA considered the extension a further step in easing the operations of small rotorcraft, which alleviates the administrative burden of simple changes, while not affecting the safety of the aircraft. However, the extension was allowed after a very rigorous study, which considered not only all the helicopters' peculiarities highlighted by AH, but also included other aspect like NVIS, Category A, and complex AFCS interconnected with FMS navigation systems. All the potential issues were investigated, which yielded to strong limitations for the applicability of certain changes or to the refusal of the extension for others.
EASA acknowledges the need to further discuss the topic and will consider the possibility to organise a workshop in the midterm with all the stakeholders with the aim of defining generally accepted criteria for the applicability of the standard changes to CS-27 rotorcraft to be implemented in the future amendments of CS-STAN.

comment

136 comment by: *Airbus Helicopters*

Airbus Helicopters observes with satisfaction that no standard repair has been open yet to Part-27 rotorcrafts. As a matter of fact, rotorcraft structures and mechanics are sensitive and the risks for safety are generally higher than for fixed-wing aircraft.

Detailed instructions are elaborated in the ICA to cover most common cases where repairs have to be performed and, in order to cover specific needs not covered or not fully covered by the ICA, we provide upon request specific instructions to our customers.

Suggestions

We encourage EASA not to extend this ability to Part-27 rotorcrafts in the future, at least not without the agreement of the manufacturers' community.

response

Noted.
EASA has applied the same concept as expressed in this comment when considering the extension of standard repairs to rotorcraft.

comment	*137* comment by: *Airbus Helicopters*

During the initial consultation on the concept of standard changes (NPA 2008-07), little attention was paid on the concept, which was probably considered as purely theoretical at that stage and possibly 'hidden' among other changes in Part-21 and the creation of the new CS-LSA.

Later, during consultation on NPA 2014-24, where the concept has been clarified with new AMC to Part-21 and Part-M, not all stakeholders have commented, for the reasons already invoked in comment #135. Nevertheless, some commenters have elaborated about several items of the concept, like:

- Lack of clear definition of persons entitled to carry out the release to service after the embodiment of standard changes or repairs (required licenses),
- Lack of control on the performed standard changes or standard repairs,
- Need for independent approval of updated manuals,
- Impacts on aircraft export and lack of related provisions in the EU-US Bilateral Agreement.

Suggestions
We suggest that, on the occasion of a workshop as proposed in comment #135, process issues be also discussed with aircraft manufacturers, especially in order to measure the risks on airworthiness of the products after alteration through standard changes / repairs.

Discussions should bear especially on:

- How to ensure that a Part-M or Part-145 organization will have the right skills to design a standard change / repair (beyond the standard instructions in CS-STAN)?
- Is there a need for an evaluation of the adequate skills (personnel's licences, need for a kind of APDOA ...)?
- How can be ensured that the standard change / repair is not in conflict with TC holder's data?
- How to ensure the traceability of aircraft configuration, with all impacts on the supply chain for spares, publications, ..?
- How can the Continued Airworthiness process ensure root cause investigations on aircrafts the configuration of which is partly unknown?
- How to ensure that the responsibility of the TCH will not be questioned in case a standard change / repair has caused an incident / accident possibly due to a side effect on other installations than those precisely addressed by the standard change / repair?
- What about transfers of aircrafts, especially in case of export?
- To which extent is it reasonable to include in CS-STAN changes or repairs which would be classified as major in the airworthiness context?

response	Noted. In case a workshop is organised, EASA will consider these inputs for discussion.

comment	*138* comment by: *Airbus Helicopters*

There is variable language in standard changes, especially in the description of acceptable methods, techniques and practices.

For example, there is sometimes a formal request that the equipment should hold a TSO/ETSO/JTSO authorisation. Sometimes, the TSO/ETSO/JTSO is precisely indicated, sometimes the text states "*if applicable, the equipment is authorised according to the applicable ETSO/JTSO or equivalent*", which is not a strong incitation: "*if applicable*" is vague, "*the applicable ETSO/JTSO*" is vague and "*equivalent*" is not defined.

Considering installers who may not be specifically skilled in design disciplines and may not know the subtleties of the airworthiness language, there should be no place for interpretation.

Suggestions
A clear, precise, unambiguous common language should be adopted in all definitions of standard changes and standard repairs.

response

Accepted
Precise ETSO reference has been added where necessary; this adjustment has been extended also to Standard Changes that were not included in the NPA.
Here after a list of Standard Changes which are amended with the aim to provide more precise references:

- CS-SC003a
- CS-SC031a
- CS-SC053a
- CS-SC054a
- CS-SC055a
- CS-SC056a
- CS-SC101a
- CS-SC153a

Additionally, the ETSO references have been removed from CS-SC033a and from CS-SC102a
Please also refer to the response to comment #56.

comment

139 comment by: *Airbus Helicopters*

According to the context in which standard changes have been initially extended to Part-27 rotorcrafts between the initial proposal (NPA 2014-24) and the published document (CS-STAN issue 1), Airbus Helicopters considers that not only the content on NPA 2016-17 needs to be reviewed, but also the contents of CS-STAN issue 1, especially where Part-27 helicopters are in the scope.

Suggestions
Due to the period of consultation, including Christmas break, we have started the review very late and consequently **we will not provide detailed comments** on each and every standard change, whether pre-defined in CS-STAN or newly proposed in NPA 2016-17.

Instead, as already stated in comment #135, **we suggest EASA to organize a workshop** with concerned stakeholders, including aircraft manufacturers, in order to solve the current issue.

We also encourage EASA to adopt a **working group** for the future evolutions.

response

Noted.
Although the creation of a specific working group is not foreseen for the time being, EASA will try to involve as much as possible the stakeholders during the development phase when needed.
Additionally, stakeholders will have the possibility to provide their proposals for the future evolution of CS-STAN by means of a dedicated reporting tool.
EASA will consider the possibility to organise a workshop in the next future to discuss the implementation of CS-STAN.

comment

148 comment by: *Yoann VIAOUET*

ASD members fully support the development of CS-STAN and efforts to reduce the administrative burden for the embodiment of changes and repairs on light / leisure aviation aircraft, whilst promoting safety.

ASD members however consider that more discussions are needed concerning the extension towards rotorcraft used and maintained for CAT/IFR operations. In this case, it would be necessary to set a longer consultation time or a stakeholder meeting to enable discussions on the proposed changes, limitations, opportunities & potential issues related to helicopters.

response

Noted.
The consultation time will probably remain 2 months in order to speed-up the evolution phase, however, EASA will try to involve as much as possible the stakeholders during the development phase when needed.
Please also refer to the response to comment #139

comment

150 comment by: *European Sailplane Manufacturers*

The European sailplane manufacturers appreciate this NPA and also applause the introduction of the CS-STAN. Feedback received from the sailplane community indicates that CS-STAN has emerged to be a very useful and important tool to implement changes and repairs which at earlier times have been not possible or were simply done in a non-documented, not rule-conforming way.
Regarding NPA 2016-17 the manufacturers also appreciate the amendments and new topics introduced and hope for fast implementation by EASA.
As an additional remark, we would propose a simple brochure-like document to explain the way a Standard Change or Standard Repair needs to be done. Despite the clear wording in Part-21 and Part-M and CS-STAN we still receive many questions about how to work with this tool and perhaps a simple brochure or “how to” could be useful here for pilots / owners / certifying staff and authority representatives? Of course, we would be available for giving input to such information material.

response

Noted
EASA will consider the possibility to create this brochure-like document.

comment

151 comment by: *European Sailplane Manufacturers*

In several locations throughout the “old” and “new” CS-STAN the wording “sailplanes and powered sailplanes” is found. This is not reflecting the fact that powered sailplanes are a

	sub-group within all sailplanes. We propose to change all such passages into "sailplanes including powered sailplanes".
response	Accepted. EASA has harmonised all the occurrences in the SC/SR affected by this NPA. Remaining occurrences will be corrected during the subsequent evolution phases.

comment	*164* comment by: *Hermann Spring* **EASA NPA 2016-17, General Feedback** **Scope** The principals to allow simpler implementation of changes given in CS-STAN is an excellent improvement. NPA 2016-17 CS-STAN is expanding the use of CS-STAN, that is well appreciated. I am very positive for the direction of CS-Stan, but I questioning, that this the long term efficient approach. On our aircraft, ELA-1 with an average age of about 30 years are some changes urgently, this to update and optimize operation, as well as for safety improvements. I propose fundamental changes in the layout of CS-Stan, to cover today's fast changes of developments in all areas. **Problem Areas** **Issuing prescriptive defined Standard Changes (SC)** If for every single kind of change a CS-SC document would be issued, CS-Stan would get a monster document. Our aircraft (ELA-1) have an average age > 30 year. Many changes are required to adapt to today's minimum operational requirements, others to update and optimize a safer operation. Today available SC & SR covering in my opinion less than 5 % of all the required items. 100% of prescriptive CS & CR would result in more pages than the AC 43.13.1&2 contains. **Readability** The content of CS-Stan, the SC's and SR's is not easy to be understood, it should be change as follows: *Grouping* Grouping shall use AECMA 1000D Specification (also known as ATA100)? *Language* Use of simplified English *Today's issue of CS-Stan implies, that the involved people preparing CS-Stan have no adequate workshop experience and also missing good technical aviation authors background.* **Real flight safety issues** A lot of details are written, but in reality, is proper workmanship and discipline while working at the aircraft he biggest risk at all. As more is written, as less careful are the workers and vice versa. After completing even simple task may result that tools be left in the aircraft resulting in a loss of control or chafing wire creating short circuits following with fire, etc. All the time used for expanded administration shorten the time available for the safety tasks. The CS-Stan does not require to prepare a simple safety analysis, however CS-Stan should mainly support safety.

Disconnecting the Competent Authority (CAA)
I feel it wrong, that changes of the aircraft configuration and its operation documentation are no more supplied to the CAA. This not for approval, but for information. Such a process would easy the CCA overview process.
Discrepancies or even safety issues could be better and earlier discovered.
Proposal how to procced
New AC43.13 1 & 2
Ideal would be to update AC43.13 1 & 2 that it replaces CS-Stan.
Might be, that this is not possible, as the AC 43.13.1&2 is an FAA document.
However, an EASA issue based on AC 43.13.1&2 could be a solution.
Add a simple chapter about safety considerations
Readability and usability
Use language of the mechanics from the shop floor.
Use Simplified English defined in AECMA SPEC 1000D, (ATA 100 grouping) as standard.
The CS-Stan part should support and this much more as guide line.
Define only the base lines for changes and repairs:
pilots release,
Part 66 licensed personnel release
Minor Change (Form 32)
Major Change, STC
CS-Stan staff should be more in touch with the hangar floor (users of CS) to optimize in total.
Safety considerations
I recommend that this will be required for every change. A short analysis of the risks, its mitigation a judgement comparing to the improvements. Simple systems require 3 sentences only.
CAA involvement
Require to send all modification information to the CAA
CAA shall have authority to agree for various non-critical modifications.
Supporting Documentation
It might be a good approach, that EASA maintains with support of the CAA's a supporting database
Refences od documents such as AMC 20-24, FOCA policy 42-00.02, (E)TSO, CS-ACNS etc.
Special consideration, grouped for systems and/or sub-systems (ATA100 please)
Limitations
Good experiences, examples, templates
Warnings and experienced problems
Feedback from users
What is at risk?
CS-Stan is not easy to handle yet. Wrong interpretation could lead in to bad modifications.
If CS-Stan is recognized as a burden, workaround solutions will be chosen.
This approach would less consider the flight safety impacts.
Cooperative approach remembering all parties to their responsibility shall be the concept
Impacts of above proposal
The resources will be more concentrating for producing safe solutions, instead of formalities.
Better understanding between authorities and modifiers, better exchange of information.
Administrative burden will be further minimised resulting in smarter solutions and better supporting documents.
Social aspect will be positive, due to cooperative approach from both side (authorities and modifiers), a win-win should be the outcome. Motivated staff produces safer solutions!

	Following the EASA approach of ***simpler, lighter and better*** is in line with the proposals given in this documents. How to proceed in details will come out in further discussion and it should remain a cooperative ongoing process. **MOTORFLUGGRUPPE PILATUS**
response	Not Accepted. CS-STAN has been introduced to simplify the embodiment of certain changes and repairs that could provide an immediate safety benefit to certain fleet that normally would not implement changes and/or repairs by means of the regular modification process. NAAs are not expected to approve design changes and, therefore, NAAs are not expected to be informed regarding the embodiment of Standard Changes and Standard Repairs. Reporting to NAAs any matters which fall outside the scope of their responsibility may create liability issues. NAAs may monitor the adequate implementation of CS-SC in individual aircraft in the frame of ACAM inspections. The structure selected for the CS-STAN allows EASA a more flexible approach for evolving its content compared to AC 43-13.

EXECUTIVE SUMMARY p. 1

comment	*10* comment by: *René Meier, Europe Air Sports* Europe Air Sports supported by European Gliding Union, European Powered Flying Union and Aero-Club of Switzerland thank the Agency for preparing a new set of certification specifications for standard changes and standard repairs. For our communities this is a further step in the direction of alleviating technical and regulatory burdens on the lower end of General Aviation, i.e. sports and recreational aviation activities. We concentrated on the multiple statement as regards «release to service» because, as before, only a minority of these standard changes and standard repairs are elligible for a release to service by the pilot-owner, a privilege ideally based on demonstrated competence. We think more could be done in this area, the slow progress made is a bit disappointing. We also identified a number of reasonably possible additional standard changes and standard repairs, we think e.g. of skis to be fitted to a normal landplane landing gear, or of alternative starter batteries for aircraft, important for operators in a cold environment, there are more, we shall therefore make use of the dedicated website portal the Agency mentions in this NPA. By doing so in the future we wish to contribute to what was started with the introduction of the "General Aviation Roadmap".
response	Noted. The release by qualifying persons (i.e. technicians) is a mitigating factor to reduce the safety risks related to changes and repairs made i.a.w. CS-STAN. EASA would appreciate to receive complete and mature proposals for additional standard changes and standard repairs to be included in the next NPA, for this purpose a dedicated reporting system has been created.

comment *16* comment by: *Royal Netherlands Aviation Organisation*

The effort of EASA staff, National Authorities, EU officials is truly appriciated. The rulemakers are aiming for a safe aviation environment and a level playing field. Unfortunately the rulemaking framework and proces is extemely complex and all the leading documents are bulky, difficult to access and nearly unitelligable for a NOT native Englishmen.

From the perspective of gliding, either owner, AML, club, ARC renewal staff, CRS staff we have to deal with: PART M, PART NCO, PART Medical, PART 21, Part FCL, ETC. Furthermore there are many AMC's, GM's and change proposals, referrals additions/ revisons. If I come to think of it, just to enjoy my (our) hobby I(we) need to reed, understand and apply regulations written down in some 6000 pages. Of course no normal individual can have all these documents available, and have a proper understanding and apply the rules as figured out by the rule makers.

Although Rulemakers are trying to detail out and write down everything in order to make aviation safe, they rulemakers achieve quite the opposite. We (owners, Part 66 staff, Part M,GF) are all killed by papers and rules, and cost to keep the bureaucratic machine working.

The objective of the rulemakers should be to keep gliding accessible, low cost, with limited rules, safe and FUN. The CS-Stan document could be replaced by 2 A-4's (instead of 58).

- A-4 one: repairs according to manufactures instuctions or Hähnle, Jacobs, AC43-13, BGA, French (as included in CS-Stan at present).
- A-4 two: all equipment may be added to gliders and TMG under the conditions:
    1. structure is not influenced/compromized
    2. airworthiness is not influenced/compromized
    3. the pilot is not hindered to aviate the aircraft
    4. weight and balance is within original specs
    5. the additional equipment does not cause additioanl hazards
    6. the added item is not critical to a safe landing (a save flight, flight safety)
    7. any added item can withstand a force of +/- 10 G in any direction
    8. the modification is documented and released.

As industry, rulemakers, pilots, owners, AML's, we should keep an open mind for new technology and the use of this new technology in our gliders when it becomes available. The whole concept of CS-STAN (although very welcome anyway), is rather late... It lags behind the trends in technology by at least 5-10 years. For example: Owners are using cameras, flight computers, navigation, IPADS, new technology batteries, new radio's, transponders for at least 5 to 10 years. All this equipment may not be installed according to the existing EASA rules. However this equipment does NOT provide a safety hazard. So please make simple rules and make these rules so generic that new technology can easily be used and installed.
Example: we get a proposal for FLARM. What if next year an alternative is marketed? Then the whole rule making proces starts again?? Please avoid this from happening and allow the installation of generic additional situational awareness systems in the new release of CS-STAN. A similar example: Batterries; why add a CS STAN for LIFEPO batteries? Next year these LIFEPO batteries may have vanised from the market and alternative batteries may be available which do a better job. Here too: just make a generic CS-STAN: Alternative battery systems are all accepted (as long as properly installed including, wiring and fusing). Same with LED Illumination? Maybe we have alterenatives in a few years (OLED?).

	Consider statistics: How many incidents with gliders have a root cause in added equipment? None? 99.9 % of incidents are pilot related (unsufficient training, preparation).
response	Noted. EASA is of the opinion that a minimum amount of instructions, definitions for applicability and limitations are necessary to ensure an acceptable safety level for standard changes and repairs. CS-STAN is intended to cover standard changes and repairs to several aircraft categories, not only to gliders. However, a Standard Change dedicated to sailplanes has already been published (ref to SC-402). Also, a Standard Repair dedicated to sailplanes has been already published (ref to SR-802). Regarding future technologies, after their assessment by the normal design approval process (i.e. STC, minor/major changes approval), the Agency may become confident about the possibility to adopt a new Standard Changes for them.

comment	*142* comment by: *GAMA* GAMA supports and welcomes this revision of CS-STAN, which has proven to be of great benefit to the general aviation community in Europe since it was first issued in 2015 by reducing the complexity and administration of making standard changes and repairs, whilst still maintaining high levels of safety. This approach allows European maintenance providers and pilot-owners to focus more time and resources on operating, upgrading and maintaining the safety of their aircraft and less time on paperwork and non-safety added processes. GAMA would also welcome the continued development of CS-STAN and further extension of these provisions for standard changes and repairs to other categories of general aviation aircraft and operations, where the safety risk is deemed to be minimal. In particular efforts should be made to further encourage the adoption of safety-enhancing equipment for GA aircraft in an affordable manner.
response	Noted.

comment	*149* comment by: *IAOPA Europe* IAOPA-Europe fully supports and welcomes this update of CS-STAN, which we consider to be a fundamental pillar of the General Aviation Roadmap project. The complexity of making standard changes and repairs has to be reduced, whilst still maintaining high levels of safety. This approach allows European maintenance providers and pilot-owners to focus more time and resources on operating, upgrading and maintaining the safety of their aircraft and less time on paperwork and non-safety added processes. IAOPA Europe would also welcome the continued development of CS-STAN and further extension of these provisions for standard changes and repairs to other categories of General Aviation aircraft and operations, where the safety risk is minimal. In particular efforts should be made to further encourage the adoption of safety-enhancing equipment for GA aircraft in an affordable manner.
response	Noted

2. EN - 2.1. Overview of the issues to be addressed p. 4

comment *94* comment by: *Danish Aviation Association*

DAA welcomes this proposal for changes to the CS-STAN. It is appreciated to use already working methods from the FAA and the UK CAA CAP materials.
We have no specific comments to the proposals, which we see as an important step forward for the GA segment.
DAA are also representing commercial small and medium enterprises. In the decription of "Applicability/Eligibility" various aircraft categories are mentioned. Although few, some of the mentioned aircraft categories are used in Commercial Operations (CAT). We recommend that the CS-STAN and the changes also are valid for commercial operations with the various aircraft and helicopters specified under the head line: Applicability/Eligibility.

response Noted.
Regarding commercial operations, the CS-STAN concept is not introducing any restriction based on aircraft operation. However, existing Implementing Rules must be considered, for instance in accordance with Regulation (EU) No 1321/2014, maintenance of aircraft used for commercial operation have to be conducted by approved 145 organisations.

2. EN - 2.2. Objectives p. 4

comment *108* comment by: *René Meier, Europe Air Sports*

2.2. Objectives
page 4/56

Many thanks for the objectives presented, we fully subscribe what is written in the second part of 2.2. We are convinced that much more should be done, could be done to really achieve the ultimate goal to support General Aviation in Europe and to promote safety at the same time.

We shall put an accent on the creation of individual lists of "aircraft type related pilot-owner competence", first of all to get an overview of progress made in this area, secondly to have clearly defined what a pilot-owner is entitled to do, and thirdly to make sure that the entire maintenance programme fits.

Rationale
Pilot-owners are capable of and willing to fulfil more maintenance tasks. They are safety-minded as they fly the aircraft they maintain. The Agency should develop more confidece in individuals taking care of the own aircraft or an aircraft shared with others, personal responsibility is the best warranty for safe flying.

response Not accepted.
Except for a limited number of cases (e.g. Appendix VIII to Part-M), the privilege of aircraft release to service is not recognised for pilot licence holders.

2. EN - 2.4. Overview of the proposed amendments p. 5-7

comment	*58* comment by: *DGAC France* DGAC France welcomes the introduction of the form on the CS-STAN webpage which will allow stakeholders to submit proposals for new SC/SR and provide feedback to improve existing ones.
response	Noted.

comment	*144* comment by: *Niklas Larsson - Member of GA Task Force, representing AOPA Sweden* IAOPA and AOPA Sweden are glad to see that EASA is continuing to develop CS-STAN by adding new provisions and amend many for the better. We hope that this NPA will be followed by another one in a year or so to keep improving these alleviations that are highly needed in this very regulatory environment.
response	Noted.

comment	*152* comment by: *European Sailplane Manufacturers* Link to CS-STAN webpage (page 5) This introduction of a link to the CS-STAN webpage sounds to be a good idea. Especially having here the opportunity to submit new topics will hopefully be used by the stakeholders. Perhaps this could be also a good location to have the proposed "CS-STAN brochure" (see our general comment) available?
response	Noted.

3. Proposed amendments p. 8

comment	*18* comment by: *Royal Netherlands Aviation Organisation* second pargraph states : CS stan cannot be used to install/exchange integrated avionic/nav systems? Why this limitation? What risk is expected? Af far as gliders are concerned the installation of an integrated avionic/nav system does not hinder safe operations and / or a safe landing. REMARK: it is with gliding / ga allready common practice that IPAD etc are used for moving MAPs. This practice is also accepted by National Authorities, which have even lifted the obligation to carry the paper map.
response	Not Accepted. The typical gliding competition computers with integrated moving map are not considered as 'integrated avionic systems' as long as they are not ETSO-approved.

3. Proposed amendments - CS-STAN Contents p. 8

comment	*88* comment by: *The Norwegian Air Sports Federation* NLF thanks the Agency for suggesting a dedicated web site portal to allow stakeholders to suggest further modifications to be eligible for the CS-STAN process.
response	Noted.

3. Proposed amendments - CS STAN.00 p. 8

comment	*2* comment by: *Samionics / General Aviation Avionics* CS STAN.00 Thoughts regarding EPA Marking. According to 21A.90B *(b) Points 21A.91 to 21A.109 are not applicable to standard changes.* Meaning this pararaph is not applicable *21A.109 Obligations and EPA marking* CS-STAN says nothing about EPA markings however AMC MA.801 *3. Parts and appliances identification The parts modified or installed during the embodiment of the SC/SR need to be permanently marked in accordance with Part-21 Subpart Q.* Also... AMC MA.801 Says that some parts may be fabricated in accordance with Subpart-F/Part-145 but does not mention Part-66 licenced staff. Subpart-F (and Part-145) fabrication requires markings according to: AMC M.A.603(c) *9. All parts, excepting those with inadequate space, should carry a part number which clearly relates it to the manufacturing/inspection data. Additional to the part number the approved maintenance organisation's identity should be marked on the part for traceability purposes.* Why not always directly refer to Part-21 Subpart Q? We think that EASA should look into this and maybe move AMC M.A.801 section 2 and 3 to CS-STAN and include a means for Part-66 licenced personell to fabricate a restricted range of parts.
response	Noted. Currently, the rule does not allow fabrication of parts by Part-66 licence holders and, therefore, AMC M.A.801 cannot contain means of compliance for the fabrication of parts by these personnel.

	EASA is working to introduce alleviations regarding to the need to issue a Form 1 under the scope of RMT.0018 'Installation of parts and appliances that are released without an EASA Form 1 or equivalent.' Additionally, EASA cannot move the AMC M.A.801 section 2 and 3 to CS-STAN because they refer to the CRS of the Standard Change and do not contain technical requirements as it is the purpose of a Certification Specification.
comment	*59* comment by: *DGAC France* DGAC France thanks the agency for the added clarifications.
response	Noted.
comment	*95* comment by: *SEGA-JB MAURICE* The SEGA is CAMO + and APDOA. For us, CS STAN is very good, but we have problems for the uninstalling of the materials. For example: Removing an old generation ADF requires the creation of a minor change folder . It is possible to provide a paragraph for the removal of simple equipment.
response	Not accepted. Removal of equipment may have an impact on aircraft limitations that needs to be covered under a regular design change process. However, EASA will consider whether for particular and well-defined cases a future standard change may be adopted.

3. Proposed amendments - CS STAN.20 p. 8-9

comment	*1* comment by: *PDG Helicopters* Am I correct in assuming that an STC approved under Part 21 may still be emodied on an aircraft which was originally built to VFR requirements to allow it to be operated in IMC conditions? Or does this mean that an aircraft which was built to VFR standards may never be converted to IFR regardless of an STC being embodied?
response	Noted. For clarification only, through the STC process it is possible to eliminate or reduce the existing airworthiness limitations and operational limitations of the aircraft.
comment	*3* comment by: *Samionics / General Aviation Avionics* Maybe something like this would be better: "e.g. an aircraft certified for VFR operation **in accordance with its TCDS** cannot be authorised to operate IFR as a result of modifications embodied through CS-STAN. Older equippment has been in many cases been downgraded to "not approved for IFR" or

	"VFR only", due to ICAO Annex 10 FM immunity requirement. This has caused some confusion since the airframe itself is still IFR approved if it is correctly equipped. ---------- Regarding limitations (AFMS). CS STAN.60 AFMS i.e. aircraft flight manual supplement. In certain cases we have seen the wording airplane and also rotorcraft flight manual supplement. Clarification of the what defenition is should be used and also basic layout of an AFMS. Note: AMC to Part-21 says that a modification requiring an AMFS is per defenition "major" but may be re-classfied minor. Thus - we have during EASA minor change applications used the term "Operating instructions" instead of "AFMS". ---------- Aircraft flight manual supplement? Basic guidelines for layout and contents. I.e. for a Piper PA28 CS23.1585 Operating procedures Book 2 Section 3 airplane flight manual which in turn refers to Gamma Specification 1. Section 9.11 contains the major headlines. Should be included in CS STAN.60? Also related to CS STAN.50 Instructions for continued airworthiness "Amend the instructions for continued airworthiness" This paragraphs is to vague - just as with the above AFMS, what layout and contents should be included in ICA? Include a reference to the aircraft type applicable (CS23/CS27).1529 Appendix G. Or include major headlines in CS STAN.50. Showing compliance with the appropriate CS23/27 paragraphs would automatically adress this issue. Any deviations should be justified in the engineering documents. I.e. wiring should be marked in accordance with "CS23.1365(c) Means of idnetifiacion for electrical cables" CS27 does not have this requirement. Justification could also be that individual wires are not marked, instead the whole wiring assebly is EPA maked as a "unit".
response	Not accepted. EASA considers that these cases have to be assessed under the regular approval process. Within the limit of CS-STAN, AFM required changes are approved as part of the Change/Repair. The distinction between Major and Minor does not apply to CS-STAN, refer to 21.A.90B.

	Due to vast range of aircraft which can embody SC/SRs, EASA has not proposed a pre-defined layout for the supplements to be issued as part of the CS/SR. EASA Form 123 should list these supplements which have to be produced by the person releasing the SC/SR.
comment	*19* comment by: *Royal Netherlands Aviation Organisation* SC cannot be used to eliminate operational limitation: Why? Example: one of possible endorsements on a SPL or LAPL(S) is cloud flying. If a Horizon/ attitude indicator is installed under CS STAN it should not be prohibited to perform the endoresemnet cloud flying! Consider the alternative to CS-STAN: A procedure for Minor change produces roughly the same paperwork as involved in CS-STAN but is more time consuming and extremely costly. Let's not even talk about a major change becaus then the regulation construct such a burden that it is prohibitive from a cost / effort point of view. Consider possible confusion: The owner adds an attidue indicator accoring to CS CStan or via a Minor/Major change? how should the pilot figure out how he/she can use the glider??
response	Not accepted. If the glider is approved for cloud flying, then the standard change concept can be used. If the glider is not approved for cloud flying the limitation cannot be removed simply by installing the equipment required but compliance with additional requirements like structure, flights characteristics, and performance have to be demonstrated which is usually impossible to do retroactively. The pilot should refer to the aircraft AFM to identify the airworthiness and operating limitation of the aircraft.

3. Proposed amendments - CS STAN.80 p. 9-10

comment	*35* comment by: *FLARM Technology* The definition/abbreviation for 'FLARM' should either be changed or removed. FLARM is not an abbreviation or acronym for, and does not mean, 'flight and alarm', as incorrectly stated in the NPA. Instead, 'FLARM' (both when referring to the FLARM system as well as the company FLARM Technology), is a proper noun; technically a *portmanteau* of 'flight' and 'alarm'. But it does not *mean* 'flight and alarm', the same way the word 'moped' doesn't *mean* 'motor and pedal', even if it's a portmanteau of those words. Or similarly, the company Accenture is a portmanteau of accent and future, but does not mean those words. All other items in CS STAN.80 are either abbreviations or acronyms, so 'FLARM' is different in that regard. If it's preferred to keep the item 'FLARM' in CS STAN.80, here is a better meaning: FLARM is a traffic awareness and collision avoidance technology for General Aviation, light aircraft, and UAVs.

response	Accepted. EASA removed 'FLARM' from 'Definitions' and Abbreviations'

comment	*60* comment by: *DGAC France* Please note that "Flarm" is not an abbreviation but a brand. So we suggest to delete it.
response	Accepted EASA removed 'FLARM' from 'Definitions' and Abbreviations'

comment	*153* comment by: *European Sailplane Manufacturers* FLARM is also a trade name for this system – on their web page they even say it is no abbreviation?!
response	Accepted EASA removed 'FLARM' from 'Definitions' and Abbreviations'

3. Proposed amendments - SUBPART B - List of standard changes p. 11-12

comment	*8* comment by: *Airbus Motorfluggruppe e.V.* We propose to add an additional standard change for batteries analogue to the proposed CS-SC034a — Exchange of existing battery by Lithium Iron Phosphate (LiFePO4) batteriesThis change would allow for the installation of closed cell batteries in replacement of the old and maintenance intensive open cell bateries. Closed cell bateries from, offer higher reliabillity, less maintenance and reduced risks through the no-need of handling battery acid. Many of the todays General Aviation A/C like the Cessna C172 and the Piper Pa28 ranges of Aircraft operate with legacy open cell bateries and an upgrade to closed cell bateries in many cases implies the introduction of an STC. Closed cells bateries are well established on the market and has a proven reliabillity record.
response	Noted This proposal will be considered during the preparation of the next amendments of CS-STAN.

comment	*13* comment by: *Samionics / General Aviation Avionics* CS-SC001a Installation of VHF communication equipment "Exchange of communications (COM) equipment, and for aircraft limited to VFR operation, also installation of COM equipment." CS STAN.20 "(e.g. a navigation equipment may be installed following a SC, but this installation may not permit that the equipment is used as a primary navigation means if the functionality did not exist before the change was embodied)." So it is ok to remove an existing COM installation and then install a new COM, this is how its

normally done but in the case of CS-STAN we call it exchange.

In our world we removed the old COM installation and installed a new - we did not exchange it, we replaced it by installing a new COM.

In some cases we even replace the antenna (if found defective or in poor condition) and antenna cable, ie. nothing is kept from the old installation.

Also in some cases we installed a second COM, this is called redundancy and should not be confused with VFR but merely as a means of added security during any flights regardles of VFR/IFR.

So an aircraft with 1 ea COM installed - this COM is exchanged for a new. An additional COM is installed (same type) but the second COM is limited to VFR.

Makes no sense... Basically - CS-STAN should avoid operational limitations (VFR/IFR) as much as possible and concentrate on proper installation methods and practices.

Also CS-SC001a, what is a "standard cable". Replace with "M17/128-RG400 or equivalent".

Add following "RG58 is not approved for new installations". Although the cable may be accepted iaw CS23.1539 (c) this type of cable is concidered low quality and often found in general electrical stores without any traceability to manufacturing standards.

What about "less than 4m". Maybe the table should also specify maximum allowed combined coaxial cable and connector loss?

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response

Partially Accepted.
CS-STAN allows for redundant or new installation of COM equipment for VFR operations.
If the aircraft is IFR, CS-STAN allows for the exchange of the COM equipment.
CS-STAN does not allow for the installation of an additional COM equipment unless the aircraft is VFR operated.
Installation of such equipment with the purpose to remove operating limitations is to be done following other design methods (i.e. STC, major changes etc)
The CS-SC001a provides guidelines regarding the length of cables but does not define the type of cable to be used.
Regarding the comment on the antenna cable, EASA will consider an update to CS-SC001a in the context of the next amendments of CS-STAN.

comment

89 comment by: *The Norwegian Air Sports Federation*

NLF would like to suggest a number of additional changes to be covered by the scope of CS-STAN:

1. Missing minor modifications:

- **Ski installations** Please refer to FAA AC No 43-13-2B chapter 5 for details and conditions. This change is regarded as a minor alteration in the US, and as the

installation meets certain minimum standards as specified in FAA AC No 43-13-2B chapter 5, no negative safety impact is expected.

- **Replacement of a main aircraft (starter) battery** with another type meeting the same minimum standards as the orignal battery. Please refer to FAA AC No 43-13-2B chapter 10 for details and conditions. This change is regarded as a minor alteration in the US, and as long as the battery meets certain minimum standards, no negative safety impact is expected.

2. Other modifications for which the CS-STAN process would be suitable:
The possibility to use alternative fixed-pitch wooden propellers without an STC, or without inclusion in the TC, has been practiced by Luftfahrt-Bundesamt in Germany for many years. Please refer to Nachrichten für Luftfahrer NfL 12/09 "Verwendung von Festpropellern aus Holz, die nicht im Luftfahrzeug-Kennblatt aufgeführt sind". NLF proposed this already in 2014, and EASA did acknowledge this proposal as a good candidate for CS-STAN Phase II.

NfL 12/09 can be downloaded with this web link:
https://www.dropbox.com/s/yvegvsw5kxf5yrj/NfL_II_12_09.pdf?dl=0

3. Modifications based on unilateral acceptance of third-country supplemental type certificates, i.e. FAA STCs:
We are aware of the positive and on-going efforts to allow an EU owner/operator to apply for a minor modification based on an FAA STC classified as a "basic STC", as per the classification criteria in the *Technical Implementation Procedures for airworthiness and environmental certification between the FAA and EASA* revision 5. While this could be a small step in the right direction in terms of making safety-enhancing technology with an FAA STC available to European general aviation pilots, we believe a more aggressive approach is needed to achieve the objectives.

The weakness of the "basic STC" route, could be summarised as follows:

- The criteria for a basic STC is not very clear as the certifying authority may categorise the STC as non-basic, based on its own subjective judgement, please refer to TIP revision 5 Appendix C Section II Chapter 6.2.5.

- Furthermore, a number of safety-enhancing modifications, such as seat belts with airbags, may not pass the objective criteria for a non-basic STC either, please refer to TIP revision 5 Appendix C Section II Chapter 6.2.1-6.2.4. In other words, the requirement for the STC to be categorised as "basic" is way too limiting to achieve the goal of the effort.
- Having tested the EASA "minor modification" route (without benefiting from the CS-STAN provisions) in the past, we can clearly say that the procedure is too demanding with regard to the administrative burden: This is not a process, which an average aircraft owner or maintenance facility can easily navigate through.
- The approval is understood to be limited to a single aircraft (one tail number). This adds an extra layer of administrative burden for no apparent safety reason.

Instead, we would like to suggest that all FAA STCs (basic and non-basic) for aircraft <u>in the ELA-2 category</u> is automatically and unilaterally adopted through a general CS-STAN standard

	change. FAA STCs for general aviation aircraft is in extensive use in Europe anyway, thanks to the significant amount of N-registered aircraft used by European private aircraft operators. The STCs have proven their safety record over the years, and they should equally be available to EASA aircraft owners. If the relevant FAA STC includes a propeller change, the approved FAA noise level should be regarded as an approved noise record in Europe, pursuant to ICAO Annex 16 Volume 1.
response	Not accepted. 1A) Not accepted. This proposal has already been considered for inclusion by EASA but eventually discarded after consideration of potential safety risks related to this modification 1B) and 2) Noted. These proposals will be considered in the frame of CS-STAN evolution. To support the identification of improvements to CS-STAN and to support its future evolution, EASA would appreciate stakeholders' voluntary feedback using the new reporting system introduced by CS-STAN — Issue 2. The submission of complete and mature proposals will facilitate consideration for adoption in CS-STAN. 3) Not accepted. Automatic acceptance of FAA STC needs to be defined in the bilateral between the US and the EU. Legally it cannot be part of CS-STAN.

comment	*109* comment by: *René Meier, Europe Air Sports* Subpart B - Standard Canges List of Standard Changes page 11/56 As future Standard Changes we propose a) Installations of skis according to FAA AC 43-13-2B b) Replacing an aircraft starter battery with a battery fulfilling the requirements according to FAA AC 43-13-2B. c) Replacing a fixed pitch wooden propeller with an equivalent without an STC or not included in the TC. d) The acceptance of FAA STCs as CS-STAN tasks. Rationale These topics/tasks fit well with the Standard Changes available today, they are well within the scope of skilled pilot-owners.
response	Noted Please refer also to the response to comments #89.

comment	*113* comment by: *Garmin International* Subpart B, Group Systems – Communication Installation of Mode A/C only transponder should be included in the "Group Systems – Communication" section of CS-STAN. A new CS for Mode A/C only transponder equipment should be modeled on the existing SC for "Installation of Mode S Elementary Surveillance Equipment".
response	Not accepted. Mode S system is considered the standard for surveillance in Europe. Additionally any Mode S on the market will also have Mode A and C.

comment	*145* comment by: *Niklas Larsson - Member of GA Task Force, representing AOPA Sweden* This comment is common for most or many of these standard changes: We require more of them to be suitable for release to service by the pilot-owner. These changes should at least align with the Appendix VIII of Part-M/ML for Pilot-Owner maintenance tasks where you will find many similar tasks that are definitely possible to release for the owner. Just as an example you can take a look at Standard Change CS-SC081a EXCHANGE OF TYRES (INNER TUBES/OUTER TYRES) and compare it with the section for Landing Gear under Appendix VIII in Part-M. The complexity of this standard change is not in any way more complicated than what is already allowed by the Pilot-Owner. You need to take a close look at the complexity of those tasks and compare it with what is already allowed. Please reconsider many of these changes and make them Pilot-Owner friendly.
response	Not accepted. In addition to other considerations, one main difference between CS-STAN and Appendix VIII of Part-M is that in the latter case it is assumed that the pilot will follow approved maintenance instructions, which are not available in the first case. Please see also the response to comment #108.

comment	*154* comment by: *European Sailplane Manufacturers* The new group is named "Group systems – Hydro-mechanical" – is there any explanation or need for the word "hydro"? We propose to call this group only "mechanical" or perhaps "structure" or to put the three new CS-SCs in group "miscellaneous".
response	Accepted. 'Hydro' has been removed.

3. Proposed amendments - Standard Change CS-SC002b p. 13-14

comment	*7* comment by: *AVAG, Eugenio Lanza di Casalanza* Why only Mode S transponders are dealed with? Part NCO does not oblige to have a Transponder S installed but only a mode A/C when requested by the flown airspace. There are lot of small aircraft or TMG whose value is not much more than a new Mode S transponder, that could install a used second hand Mode A/C unit at a more reasonable price. Also this possibility should be taken in consideration.
response	Not Accepted. Mode A and C are possible only under limited conditions (VFR only) and only in some countries. In addition, there is the intention to promote Mode S to avoid channel overload (frequency band).

comment	*20* comment by: *Royal Netherlands Aviation Organisation* Under 1 Purpose: What is the meaning/consequence of "does not satisfy CS-ANCS etc ... nor AMC 20-24. Leave this sentence out, I figure the consequences are detailed out under par. 3 dash 3 Please avoid the referrel in CS-SC002, and complete CS-SC002 with the aspects / limitation of CS-ANCS and/or AMC20. Primarily we want to fly and not read and collect papers. Does this CS SC002 also apply toe ELA-1 / gliders? Under 5 bi-annual check according to CS-ACNS.A.Gen10 (what does the check require, avoid referral), is not specified in part m.a.302(i) = EASA Minimum Inspection program for gliders, which specifies an operational check. I presume you are familiar with the difference between operational and functional spec's accoridng to the definitions.
response	Partially accepted. The limitations of this Standard Change have been moved to the paragraph ‘limitations’. This Standard Change applies to ELA-2 which includes ELA-1 aircraft. Regarding the two-yearly check, the scope is to verify the complete readout in line with EASA SIB No. 2011-15R2. This clarification has been introduced in the Standard Change. The functional check that is required by CS-STAN covers the operational check mentioned by Part.M.A.302(i).

comment	*47* comment by: *Luftfahrt-Bundesamt* <u>LBA comment</u> 3. last dash: The ground test shall also include voluntarily transmitted ADS-B data (if any).
response	Accepted. Change has been introduced.

comment	*114* comment by: *Garmin International* Subpart B, Standard Change CS-SC002b, Paragraph 3

Paragraph 3 states, “This SC does not comply with AMC 20-24. However, the voluntary transmission of additional ADS-B data (e.g. GPS position and velocity) can be accepted when the position and velocity quality indicators report lowest quality, the equipment manufacturer has stated compatibility with the directly connected GPS source, and the transponder is not authorised according to ETSO C166b or equivalent.”

This restriction on quality metrics and equipment ETSO is inconsistent with the intent that is implied by the addition of SC-CS058a “Installation of traffic awareness beacon system (TABS) equipment”. The intent appears to be the allowance of installations that voluntarily transmit ADS-B data if the position source meets the ETSO-2C199 requirements for such sources, and the transmission of quality metrics also meets the requirements of ETSO-2C199. It is assumed that ETSO-2C199, like the FAA’s TSO-C199, will include an equipment class for the position source (ref. TSO-C199 paragraph 3.a), and requirements for transmitted quality metric values (ref. TSO-C199 paragraph A1.2.5.6).

Given the implied intent of SC-CS058a, CS-SC002b should allow the pairing of a Mode S transponder with ETSO-C166b (or equivalent) authorization with a TABS position source. The following is suggested as a replacement for the item quoted above:

This SC does not comply with AMC 20-24. However, the voluntary transmission of additional ADS-B data (e.g. GPS position and velocity) can be accepted. CS-SC058a may be applied concurrently for a TABS position source paired with a Mode S transponder with ETSO-C166b (or equivalent) authorization. When a TABS position source is used, the position and velocity quality indicators must be reported according to ETSO-2C199. If a TABS position source is not the position source for ADS-B data, then the position and velocity quality indicators must report lowest quality (i.e. zeros).

response

Accepted
Sentence added on the CS-SC002b

3. Proposed amendments - Standard Change CS-SC032a p. 15-16

comment

21 comment by: *Royal Netherlands Aviation Organisation*

ELA-1? Or is ELA-2 always including ELA-1?

response

Noted.
ELA-2 always includes ELA-1.

comment

48 comment by: *Luftfahrt-Bundesamt*

LBA comment

1. first sentence:
Insert: “… installations *on wing tips, vertical tail tip and/or fuselage* for aircraft…”
Add: “This SC is restricted to the installation of lightweight (< 120g) low profile LED devices.”

	3.1/3.2 fourth dash: Compliance finding for CS23.1401 is beyond the general intention of CS-STAN and should be removed. 3.1 fifth dash: The FAA AC 23.629-1B concerning flutter defines weak and difficult to evaluate similarity criterions. If the SC would be restricted as mentioned above the flutter risk would be eliminated and the similarity discussion would become obsolete. The two cases (3.1 and 3.2) should be combined together without the AC 23.629-1B reference. A full EMI test must be performed after the installation because strobe lights may be a source of RF interference.
response	Partially accepted — Clarification on purpose: accepted. — Limitation on lightweight and LED technology: not accepted. This would become a too arbitrary criterion. The potential impact on flatter has been addressed within paragraph 3.1 — Deletion of reference to CS23.1401: Accepted — Similarity concept: Not accepted. The AC 23.629-1B Chapter 1, paragraph 1c is an FAA a well as an EASA recognised document. The similarity criteria to be considered are clearly identified by AC 23.629-1B Chapter 1, paragraph 1c and should be achievable for most of the aeroplane configuration. — Comment on Full EMI test: Not Accepted. The referenced AC 43.13-1B Chapter 11, Sections 106 and 107 gives already information on EMI and interference tests to be conducted.

comment	*61* comment by: *DGAC France* Considering that "LED type" anti-collision lights are a suitable alternative to the "conventional bulb lights" and that they are already widely available at an acceptable price, DGAC France suggests to extend the applicability of this SC to "LED type". So DGAC France suggests clarifying that this CS covers "conventional" and "LED type" anti-collision lights. To cover "LED type", the following should be added: "In particular, consider description of required maintenance actions after failure of a single LED segment" in paragraph 5. In paragraph 3, the following standards should be added: "FAA Advisory Circular AC 43.13-1B, Chapter 11, Section 15 (on bonding)." In paragraph 3.2, the following should be added: "any modification of electrical wiring is performed in accordance with acceptable practices such as the aircraft maintenance manual or Chapter 11 of FAA Advisory Circular AC 43.13-1B."
response	Partially Accepted. The current text of this SC is not limited to conventional lights and the ETSO mentioned is also applicable to LED. Therefore, this SC already covers LED. Comment on Paragraph 5: Not accepted EASA is of the opinion that the light manufacturer should include the requested maintenance

	in case of failure of a single LED segment. This should not become part of CS-STAN. Comments on Paragraph 3: Accepted

comment	*90* comment by: *The Norwegian Air Sports Federation* NLF supports this proposal as it will enhance safety and reduce cost. However, NLF believes that direct replacement bulbs/light fittings should qualify for pilot-owner release to service.
response	Not accepted. This standard describes the installation on aircraft that were not certified with anti-collision lights. Direct replacement is not covered by this standard as indicated. The replacement of failed bulbs is covered by Part-M.

comment	*96* comment by: *CAA CZ* **1. CS-SC032a — Installation of anti-collision lights (new)** a. Chapter 3: Please consider shortening two sentences "The equipment is authorised in accordance with ETSO-C96a or later amendments, or equivalent; ~~otherwise the equipment shall comply with CS 23.1401(b) through (f) requirements~~". In our opinion, the process under the second part of the sentence cannot be done as standard change (SC) – it is regular type-design change. b. Par. 3.1: Similarity assessment: In our opinion it is not realistic to expect that the installer is capable to reliably asses aircraft similarity based on references criteria included in AC 23.629-1B. c. Is the SC applicable for (especially fuselage) installation in composite structure aircraft? Chapter 4: What is the purpose of the following sentence: "Installation of new anti-collision lights in high aspect ratio wings is not permitted unless the conditions of point 3.1 are met"? The referenced point 3.1 conditions apply to all types of wings, including high aspect ratio wings? The sentence seems not to bring any new information/value.
response	Partially Accepted. a) Accepted. b) Not accepted. AC 23.629-1B Chapter 1, paragraph 1c is an FAA as well as an EASA recognised document. The similarity criteria to be considered are clearly identified by AC 23.629-1B Chapter 1, paragraph 1c and should be achievable for most of the aeroplane configuration. c) Noted. This CS is not limited to specific material, however, standard practices associated with composite material should be considered when anti-collision equipment is attached to composite structure. AC 43.13-1B and AC 43.13-2B also address composite materials. Chapter 4) Accepted. Please refer to the response to comment #155.

comment	*155* comment by: *European Sailplane Manufacturers* Under point 3.1 the 5th bullet asks for "…Anti-collision lights may be installed if their total weight including reinforcements is equal or lower than a certified anti-collision lights installation on a similar aeroplane. …" This leaves open the question what to be done in the case of a sailplane (which is no aeroplane). We either propose here to change the word "aeroplane" to "aircraft" (2 times in this bullet) or to give further instruction for the case of sailplanes. Furthermore, the last sentence in this point 3.1 requires that "Anti-collision lights installation shall not alter torsional stiffness." Of course we support this requirement (e.g. to prevent flutter cases caused by such installations), but we assume that the persons implementing the modification will not know how to check / how to comply. We suppose that the already referenced AC 43.13-1B already contains useful information about this issue but it would be helpful to cite under point 3.1 a clearer indication for locating such info material. Under Point 4 there are two limitations given: "Only installation on wings without sweep angle is allowed." – here it would be useful to define a range, e.g. "…on wings where the sweep angle of the quarter-chord line as sweep between + 5 and – 5 degree". Otherwise it remains totally unclear whether a certain wing has a sweep angle or not (leading edge / trailing edge or what?). "Installation of new anti-collision lights in high aspect ratio wings is not permitted unless the conditions of point 3.1 are met." – we consider this limitation not to be clearly enough worded. First a definition of "high aspect ratio" needs to be done, e.g. by specifying a limit, like "aspect ratio above 15" (We think the persons involved need what the aspect ratio is…). Also the second part of the sentence "unless 3.1 is met" makes no sense, as 3.1. needs to me complied with anyway for an installation on a wing?! We also propose to use the wording of the following CS-SC033a about the electrical wiring "any modification of electrical wiring is performed in accordance with acceptable practices such as the aircraft maintenance manual or Chapter 11 of FAA Advisory Circular AC 43.13-1B." also in CS-SC032a, as this give a clear indication what to do (instead of just referencing this chapter 11). Last but not least we propose a new weight & balance report after installation of anti collision lights to be done (at least by calculation or in the case of a new installation at the empennage by weighing).
response	Partially Accepted. — aeroplane vs aircraft; accepted.

— Torsional Stiffness; noted.

The requirement is intended to preclude flutter and it was considered upfront that CS-STAN users might not have the tools/knowledge/resources to comply; that's why, the requirement was simplified to the maximum extent. Removing parts or simplifying even more the requirement might lead to serious uncontrolled risks.

Should a user not be familiar with the flutter phenomenon, compliance, and physical mechanism they should refrain from applying this change under CS-STAN premises or require support from a duly qualified organisation.

— sweep angle: not accepted

Without sweep angle, means sweep angle=0. It is considered to be clear.

The requirements are intended to preclude flutter and it was considered upfront that the CS-STAN users might not have the tools/knowledge/resources to comply; that's why, the requirement was simplified to the maximum extent. Sweep angle has an effect in coupling bending-torsion flexural modes. Considering that many applicants are not familiar with the basics, EASA believes that this limitation is necessary.

— 'high aspect ratio': partially accepted

The aspect ratio threshold has been defined in the CS-STAN. Nonetheless, aircraft with aspect ratio higher than the defined threshold might be eligible for the embodiment of this standard change if the similarity criteria is met.

— Comment on electrical wiring: Accepted.

The text has been amended.

Weight and balance consideration has been added.

3. Proposed amendments - Standard Change CS-SC033a p. 17-18

comment

17 comment by: *Royal Netherlands Aviation Organisation*

Limit the CS stan not just to LED. Make it possible to install other suitable light sources as tehy become available. By specifying just one technology, for each alternative the rules need to be changed. Just rule making does nit bring more safety and only is caus for a slow European rulemaking proces.

under 2 Applicabilty: does this CS-STAn also apply to ELA-1 / gliders?

response

Not acceptable.
Other technologies will be considered when available in order to address their specificities as necessary.

comment

49 comment by: *Luftfahrt-Bundesamt*

LBA comment

In order not to require too much engineering skills and not to alter the pilot machine interface too much, this SC should be restricted to the exchange of lights.

	The installer must identify the interface parameters (e.g. voltage, current, brightness, color, shape, mounting) of the existing lights with the help of the aircraft AMM or an equivalent document. Then an equivalent LED light must be selected in accordance with OEM's specifications. The data used for that purpose need to be recorded. This SC shall not include the installation of lights self-modified by the installer, unless the light modification is described and authorized by the OEM. This SC should mention that colors must not be changed. The wiring (except interface terminals) should not be modified. Replacing filament lamp based lights by those utilizing LED(s) typically also affects the dimming provisions which may in turn affect the EMI behavior.
response	Partially Accepted. Restriction to exchange of lights: Partially Accepted. Installation of new lights is only allowed for lights other than caution, warning, and advisory lights and, for other lights it is allowed only if they do not interfere with these lights or with the pilot. The text has been improved accordingly. Colours change: Not Accepted. Specific provisions and limitations have already been included in the text of this SC, ref to paragraph 3, to address the colours considerations. Wiring modification: Not Accepted. Wiring can be modified if it is performed in accordance with acceptable practices like in others standard changes. EMI considerations: Accepted. In Section 3 the reference to FAA Advisory Circular AC 43.13-1B, has been amended to include Chapter 11

comment	*97* comment by: *CAA CZ* **1. CS-SC033a — Installation of cabin and cockpit conventional lights by LED-type lights (new)** a. Chapter 1: Please consider limiting the scope of allowable LED light types by extending the sentence in Purpose: "Installation or exchange of cabin and cockpit conventional lights by LED-type lights ***(excluding LED stripes and LED tubes)***." b. It should be clearly/explicitly stated that in case of installation of new LED lights, it is not allowed to install warning, caution, or advisory lights. Chapter 3: Please consider extending the requirement for new or exchange LED lamp like this: "…with identical light distribution angles**, colours and colour temperatures**".
response	Partially Accepted. a): Not accepted. Already existing certification requirements do not differentiate among LED-type lights, provided that they comply with the requirements. b): Accepted. The text has been modified accordingly. Chapter 3: Not Accepted. The requirements only ask for colours characteristics, colour temperatures are not requested nor defined.

3. Proposed amendments - Standard Change CS-SC034a p. 19

comment	*22* comment by: *Royal Netherlands Aviation Organisation* 1 purpose: Request: do not limit this CS to LiFePo. Allow alos other battery technology as long as it is properly installed, wired safely, correctly fused, and operation conditions (temperature) are in compliance. Please adopt this CS- for other battery technologies available at present or in the futures. 2 Why a limitation for gliders? 4 Limitation: > Why are starter batteries not covered? What is the alternative for the owner? Apply for a minor change? Just a lot of paper and cost? LiFePo works very well as starter battery by the way! So pleas allow this application. > Why specify an obligatory battery management system? We do not have such regulations in palce for Lead batteries either? Please do not provide detailed technological requiremenst. Just generic is fine. > Why a limitation of 100 Watt/hour? At present we do not have such a limitation for Lead batteries either. There are quite a number of gliders flying aroud with much higher capacities in Lead Batteries? 6 releas to sevice This can very well be listed as Pilot Owner Task. The POM can/ may also replace a sealed LEAd battery.
response	Partially accepted. 1 Purpose: Not accepted. The chemistry of lithium batteries is main contributor to the risk linked to the batteries. LiFePo has shown to be very safe in handling and operation, and with low risk, while other chemistries, for example metal oxide chemistries, impose a higher risk of self-ignition and need a due control. By that, currently the starting point is the low risk $LiFePO_4$ chemistry. 2 limitation for gliders: not accepted. The possibility to create a new SC on lithium batteries has been retained for consideration in the context of future CS-STAN evolution. The new SC will take into account the results of the RTCA DO311 revision A which is currently under development and will lead to an update of ETSO. The new standards and related battery qualifications may allow an extension for certain limitations introduced for CS-SC034a. 4 Limitation to starter batteries: Not accepted. The possibility to create a new SC on lithium batteries has been retained for consideration in the context of future CS-STAN evolution. The new SC will take into account the results of the RTCA DO311 revision A which is currently under development and will lead to an update of ETSO. The new standards and related battery qualifications may allow an extension of certain limitations introduced for CS-SC034a.

	4 battery management system: Not Accepted. This functionality is needed for lithium batteries. 4 Limitation to 100 Watt/hour: Accepted. EASA agreed to increase this value to 160Watt/hour. 6 Release to service: Not accepted. Please refer also to the response to comment #108
comment	*91* comment by: *The Norwegian Air Sports Federation* NLF supports this proposal as it will enhance safety and reduce cost. However, NLF believes that the eligibility should also include ELA-2 aircraft.
response	Not accepted. Please refer to the response to comment #22.
comment	*98* comment by: *CAA CZ* **1. CS-SC034a — Exchange of existing battery by Lithium Iron Phosphate (LiFePO4) batteries** **(new)** Chapter 4: requires that "The battery shall have an integrated battery management system". A simple definition of a battery management system functionality that satisfies this requirement would be useful.
response	Partially accepted. The SC is updated to include a link to systems provided by the manufacturer.
comment	*156* comment by: *European Sailplane Manufacturers* Under point 3 some acceptable standards are listed, which have to be performed by the manufacturer. We assume, that this is the equipment (battery) manufacturer – it should be stated that way. Furthermore, this triggers the question how the buyer/installer could verify that this standard has been adhered to? Perhaps we need some wording like: it should be checked that the battery manufacturer has taken these standards into account…? The limitation to 100 Wh is too low. The typical sailplane lead battery (used for avionics and the radio) is of the 12 V 6.5 – 7.2 Ah size (typical weight around 2.5 kg). Existing LiFePo battery suppliers offer replacement batteries with the same (geometric) size and those have then between 100 and 150 Wh). Those batteries should be included in the SC. The exclusion of starter batteries makes sense as the needed power could result into further tests and calculations, which probably go beyond the scope of this SC. But then also any re-charging in flight (e.g. due to a generator working in-flight on a powered sailplane or by means of solar power) should be excluded as – again – further tests or calculations could be needed.

	Last but not least we propose a new weight & balance report after installation of such batteries to be done (at least by calculation or in the case of a new installation at the empennage by weighing).
response	Partially Accepted. First paragraph: not accepted. Regarding compliance declaration with applicable standards, the SC has already a clear link to the manufacturer. Second paragraph: Please refer to the response to comment #22. Third paragraph: not accepted. Please refer to the response to comment #22. Fourth paragraph: Accepted. A reference to the weight and balance has been added.

3. Proposed amendments - Standard Change CS-SC051b p. 20-21

comment	*23* comment by: *Royal Netherlands Aviation Organisation* Change this CS in to a generic version for anti collision systems. There may be alternative systems coming to market. We should not regulate the use of a propriatory technology from one specific supplier. We should not manouvre ourselves as owners and rulemakers into a position were we are subject to the unpredictable whimps of one commercial company. Under 3 dash 3: remove the statement about connectivity. under 4 limitations: superfluous statement. FLARM is unreliable day and night. Night condiotions or cloud flying conditions will not make the system less relaible. Flarm is just a secondairy aid, not meant for reliable anti collision warning.
response	Not acceptable. The displays of these unapproved equipment are not certified for night operations.

comment	*36* comment by: *FLARM Technology* We propose the following changes to the FLARM standard change (CS-SC051b): 1. FLARM systems are both manufactured by FLARM Technology but also by OEMs under license. These OEM FLARM systems are full FLARM systems (per se), and not just 'compatible' with FLARM. The word 'compatible' is instead reserved for displays and other equipement that is connected to a FLARM device. To avoid confusion, under "1. Purpose", "Installation or exchange of FLARM® compatible Anti-Collision Awareness Systems" should be changed to "Installation or exchange of FLARM® traffic awareness and collision avoidance systems". That also includes a better explanation of the system. 2. The company FLARM Technology has changed its legal structure from GmbH to Ltd.

"FLARM Technology GmbH" should be changed to "FLARM Technology Ltd.".

3. Many FLARM devices incorporate an SSR (Mode-C/S) and ADS-B receiver (e.g. PowerFLARM Core ADS-B), which is incorporated into the collision avoidance logic. The note under "1. Purpose" can therefore be misunderstood, and should be changed to "Note: FLARM does not constitute a Transponder Mode A/C/S, ADS-B Out or TCAS/ACAS system".
4. The Applicability/Eligibility should be changed to be similar to other SCs: "Aeroplanes not being complex motor-powered aircraft, rotorcraft not being complex motor-powered aircraft and any ELA2 aircraft". There will soon be FLARM devices/systems on the market with Form 1. Also, the Form 1 requirement is an equipment requirement and SC/MCA is an installation requirement, so those should be kept distinct.
5. Under section 3, the reference to "FOCA policy 42-00.02" and the note below should be removed. This document was published by the Swiss CAA before they joined EASA, is not kept updated, and contains several errors.
6. At the end of section 3, the following item should be added: "- The effective range of the installed system must be verified after the installation and the first few flights by using the FLARM Range Analyzer: http://flarm.com/support/tools-software/flarm-range-analyzer/".
7. At the end of section 5, directly after the last sentence, add: "This must include an annual firmware and database update, which is required every 12 months.".
8. Either at the beginning or end of this SC, add the following note: "A more flexible EASA-approved Minor Change Approval (MCA) is available from FLARM Technology: http://flarm.com/shop/easa-minor-change-approval-mca/".

response

Partially accepted
1: partially accepted
2; accepted
3: accepted
4; not accepted. For the time being this limitation is kept because the aircraft under discussion typically carry more complex avionics and systems where proper integration need more detailed design considerations.
5: the Agency agrees to remove the superseded FOCA guidance. Items which are still applicable have been transferred into the Standard Change
6: accepted
7: accepted
8: not accepted

comment

64 comment by: *DGAC France*

"FLARM" is not compatible with Transponder Mode A/C/S, ADS-B or TCAS/ACAS." Please be aware this note might be not true for some" Flarm" models.
Actually, this is an option and could be implemented in some devices (PowerFlarm with additional SSR).
Therefore, DGAC France suggest to modify the note as follows : "~~FLARM is not compatible with Transponder Mode A/C/S, ADS-B or TCAS/ACAS~~ data connectivity with the installed Transponder Mode A/C/S, ADS-B or TCAS/ACAS equipment is not covered by this SC".

response

See reply to comment #36

3. Proposed amendments - Standard Change CS-SC052b p. 22-23

comment	*14* comment by: *Samionics / General Aviation Avionics* AC20-138D Appendix 6 A6-2 "Loss of or misleading VFR navigation information is considered a minor hazard failure condition; therefore, it is acceptable to have development assurance level D for software per RTCA/DO-178B or 'C', and electronic hardware, per RTCA/DO-254." The whole idea is that we should be able to install a certified or non certified ie a Garmin GPS Area 500 moving map in a dedicated avionics stack or at some other location. The Garmin 500 unit has no E/TSO so it has no stated software assurance level. CS-SC052b par 3. FAA Advisory Circular AC 20-138D, including Change 1 and Change 2, Appendix 6, with the exception of paragraphs c and f. Include a statement that software certification is not applicable due to no ETSO requirement. Installed parts that lack E/TSO and/or DO-160 should be allowed to be installed in aircraft but should be installed in such a way that the part may be removed without the use of tools.
response	Not accepted. The case referred to by the commentator is considered to be a portable electronic device for which CS-SC052b does not apply.

comment	*24* comment by: *Royal Netherlands Aviation Organisation* combine into one CS with CS 057 about GPS (remark a GNNS system deos not work without GPS).
response	Not accepted. GNSS is the umbrella for all the global satellite navigation systems. The second one is a more integrated installation. EASA eliminated all the GPS references from the proposed amendments.

comment	*66* comment by: *DGAC France* Considering the GNSS definition as indicated in FAA AC 20-138 "*GNSS is used internationally to indicate any satellite-based positioning system or augmentation system. The acronym 'GNSS' includes satellite constellations, such as GPS, GLONASS, Galileo, or Beidou, along with augmentation systems such as 'SBAS' and 'GBAS'; all of which provide a satellite-based positioning service*", DGAC France suggest to modify the title as "Installation of VFR GNSS moving map equipment". The words "GNSS equipment" is confusing about the scope of this SC. It shall be clarified that this SC is only about moving map equipment.
response	Accepted. Wording has been slightly changed to enhance clarity.

comment	*67* comment by: *DGAC France*

	In paragraph 1, DGAC France suggests to modify the second paragraph as "This SC does not cover the installation of external antennas (see CS-SC004, which may be applied concurrently)." to be consistent with SC057a. In addition, DGAC France suggests to add the following note : "Multifunction Display equipment is covered by this SC".
response	Partially accepted. Standard text for external antenna has been accepted. MFD are not covered by this SC due to their complexity and possibility to direct impact aircraft operation.

comment	*68* comment by: *DGAC France* The paragraph 2 "Applicability/eligibility" is similar than the FAA AC 20-138 but this eligibility is not aligned with the already used European limitation. So DGAC France suggests clarifying the eligibility by stating "un-pressurised aircraft less than 2 730 kg MTOM"
response	Accepted. The applicability has been amended.

comment	*69* comment by: *DGAC France* This SC appears to be somewhat ambiguous, because it is no clearly indicated if it can be installed also in an IFR aircraft. Therefore we suggest adding in paragraph 2 "Applicability/eligibility": "Note : The installation of a GNSS moving map equipment in an IFR aircraft is covered by this SC within the limitations stated in paragraph 4 "
response	Not accepted. Navigation equipment limited to situational awareness are not suitable on IFR aircraft.

comment	*70* comment by: *DGAC France* Paragraphs 4 and 5 states that the moving map shall be used only in day VFR. Considering that this equipment shall be only installed "For situational awareness only", DGAC France suggest to modify the paragraph 4 limitation as "The system is used for situational awareness under VFR ~~day~~ operations only" and paragraph 5 as "Use in VFR ~~day~~ only". In addition, DGAC France proposes to add the following limitation in paragraph 4: "The moving map must not be used as a primary means of navigation for any kind of operation."
response	Partially accepted. The SC has been amended to remove the reference to 'VFR DAY', the SC is now applicable to VFR operations. For IFR operation, a more controlled installation with full compliance demonstration is needed.

comment	*99* comment by: *CAA CZ* **1. CS-SC052b — Installation of VFR GNSS equipment/moving-map systems to enhance situational awareness (amended)**

a. It would be helpful to clearly define what is acceptable composition of a system covered by this SC (i.e. whether it is a Moving map system with embedded/integrated GNSS/GPS sensor and/or (also) Moving map system without its own GPS sensor (that can be combined with SC0057a), etc.

b. Chapter 3: Ambiguous wording of the data connectivity requirement, we propose change text like this: "data connectivity between with the installed equipment and other equipment (…) is not allowed unless the equipment being installed is explicitly listed **by ~~its~~ manufacturer of the installed equipment** as compatible equipment to be connected to".

NOTE: This remark applies for other SCs (e.g. CS-SC057a) too.

response

Not accepted.
a) CS-SC052b has been combined with CS-SC057a, therefore, its scope has been enlarged allowing for a variety of architectures.
b) the proposed wording is not considered as a substantial improvement.

comment

115 comment by: *Garmin International*

Subpart B, Standard Change CS-SC052b, Paragraph 3

Includes the following bullet, "— FAA Advisory Circular AC 20-138D, including Change 1 and Change 2, Appendix 6, with the exception of paragraphs c and f."

"paragraphs c and f" are subordinate to paragraph A6-4. Technical Instructions.

Suggest changing to "…, with the exception of paragraphs A6-4.c and A6-4.f."

response

Accepted.
The text has been amended accordingly.

comment

116 comment by: *Garmin International*

Subpart B, Standard Change CS-SC052b, Paragraph 3

Includes the following bullet, "— data connectivity between with the installed equipment and other equipment which is: … is not allowed unless the equipment being installed is explicitly listed by its manufacturer as compatible equipment to be connected to;"

The "is not allowed unless the equipment being installed is explicitly listed by its manufacturer as compatible equipment to be connected to;" portion of the bullet should be appropriately indented to ensure there is no confusion that this text is a separate bullet.

response

Accepted.
The text has been amended accordingly.

comment

117 comment by: *Garmin International*

Subpart B, Standard Change CS-SC052b, Paragraph 5

	The requirement for an AFMS is an unnecessary impediment to installation of VFR GNSS equipment/moving-map systems. FAA Advisory Circular AC 20-138D, including Change 1 and Change 2, Appendix 6 allow for a placard to be installed in lieu of requiring an AFMS. Suggest that CS-SC052b should be further aligned with AC 20-138D Appendix 6 to maximize the safety benefits that will be achieved from installation of VFR GNSS equipment/moving-map systems. At a minimum, allow either placard(s) or AFMS but do not require both. Additionally, rather than the very specific requirements for AFMS contents, it would seem more appropriate to simply reference "the equipment instructions for operation, as required" as is allowed by CS-SC002b for Mode S.
response	Partially Accepted. The reference to placards has been removed, however, EASA disagrees to be less specific on AFMS contents.

comment	*140* comment by: *JP Avionics* Removed Un-pressurised from applicability / eligibility as antenna installation is not included, so no need to make change between pressurised and un-pressurised.
response	Not accepted. This applicability limitation is not related to antenna installation but rather to the type of aircraft on which the installation is allowed.

comment	*157* comment by: *European Sailplane Manufacturers* Under point 2 we propose the wording "non pressurised" instead of "un-pressurised".
response	Accepted. The text has been amended accordingly.

3. Proposed amendments - Standard Change CS-SC057a p. 24-25

comment	*34* comment by: *EHA* This NPA still doesn't include helicopters for CS-SC057a - the installation of GPS. It makes no sense, because the CS-SC052b, installation of GNSS/Moving map is applicable to all unpressurised aircraft up to 2721kg/6000lbs. There is no justification in leaving installation of GPS at ELA2, therefore EHA is asking, that CS-SC057a is altered to include all non-pressurised aircraft up to 2721kg etc to bring it into line with the CS-SC052b? EHA (European Helicopter Association) Wolfgang Burger

response	Accepted. Applicability of CS-SC052b has been extended. Additionally, please refer to the response to comment #40.

comment	*40* comment by: *AeroClub Roger Janin, FR.ATO.0087* TITLE : What does it means « to support VFR navigation » when it is limited to 'Advisory, only'; 'Not for primary navigation' , and as a consequence it does not fulfill NCO.IDE.A.195 *" Aeroplanes operated over routes that cannot be navigated by reference to visual landmarks shall be equipped with any navigation equipment necessary to enable them to proceed in accordance with…"* ? What can we do with a CS-SC057a equipped aircraft that we cannot do without this SC057a equipment?
response	Accepted. EASA concurs that the CS-SC057 does not provide to the owner/operator any additional benefits over a system installed per CS-SC052. CS-SC052 has been amended and CS-SC057 has been removed.

comment	*41* comment by: *AeroClub Roger Janin, FR.ATO.0087* a) 2 - Applicability/Eligibility Is there any reason for different applicability between SC52 and SC57 ? Please clarify and justify.
response	Accepted. Please refer to the response to comment #40.

comment	*42* comment by: *AeroClub Roger Janin, FR.ATO.0087* 3 - Acceptable methods, techniques and practices For consistency, please show FAA AC's in the same order between SC052 and SC057, or explain (in the CS-STAN document, or an AMC-GM not yet existing ?) the meaning of the different order.
response	Accepted. Please refer to the response to comment #40.

comment	*43* comment by: *AeroClub Roger Janin, FR.ATO.0087* 4 - Limitations — The equipment must not be used for IFR operations or as primary means of navigation for any other kind of operation; and 4 - Manuals - 'advisory only', 'Not for primary navigation' Comments : a) this is far more limiting than AC 20-138 Appendix 6 (listed in 3. Acceptable methods,

techniques and practices) para. F which states “GPS APPROVED FOR VFR USE ONLY“

b) As written, we understand that SC057a means this GPS does not fulfill NCO.IDE.A.195 for VFR over routes that cannot be navigated by reference to visual landmarks (on top, over water/remote, and possibly night navigation ?) : what is the benefit of installing such costly IFR / PBN certified / TSO’d navigation equipment (around 10.000€ *) in the frame of CS-SC057a if it does give ZERO benefit for VFR operation? (= with this equipment installed, I can't do anything more than without). Please change SC057a to "GPS APPROVED FOR VFR USE ONLY" as per AC 20-138.

(* my handheld car GPS (12 channels receiver, bought used at 30€) + freeware found on internet + 500.000 digital aeronautical chart (at 15€/year) gives me the same “awareness” since several years, on all aircraft I fly. In addition it allows preparing the flight plan in advance at home, and analyzing the flight path record afterward)

c) What is the interest to have two different SC’s 52 and 57 as there is so little difference between them regarding the benefit of the installation in term of operation capability, which remains ZERO?

response

Partially Accepted.
Please refer to the response to comment #40.

comment

44 comment by: *AeroClub Roger Janin, FR.ATO.0087*

4 - Limitations : "All integrated databases (e.g. for charts) must be current"

- “or navigation data used for the flight must be checked with current published data” must be added at the end of the sentence,
- “(e.g. for charts)” must be removed. At the best to be put in a GM.

response

Not accepted.
Please refer to the response to comment #40.

comment

45 comment by: *AeroClub Roger Janin, FR.ATO.0087*

Comment:
Title, text and referenced documents are GPS only.
What about other GNSS systems, especially GALILEO which will be operating soon and avionics availability will follow very quickly.
With a well known internet search engine, search for EASA+galileo finds nothing ; same result with EASA website search tool. What are EASA plans to be ready at least at the same time as avionic boxes availability on the market?

response

Accepted.
Please refer to the response to comment #40.

comment

71 comment by: *DGAC France*

The title of this SC is very confusing because it is introducing limitation. So DGAC France suggests to simplify the title as :”Installation of a GPS system ~~to enhance situational awareness and to support VFR navigation~~”.

response	Accepted. Please refer to the response to comment #40.

comment	*72* comment by: *DGAC France* The note "CS STAN.20 applies" is not needed in this SC as all CS-STAN Subpart A is applicable to Subparts B and C. So, this note must be deleted.
response	Accepted. Please refer to the response to comment #40.

comment	*73* comment by: *DGAC France* DGAC France believes there is a need of consistency between acceptable methods and associated limitations. For instance, SC057a is referring to a list of EASA TSO to install a GPS system. However, this equipment must not be used as primary means of navigation for any kind of operation according paragraph 4 and 5. These limitations are not consistent with the TSO requirements in paragraph 3. Therefore, considering that the GPS must be TSO'ed (and in case of the GARMIN GNS 4xx/5xx GTN6xx or 7xx the others SCs for VHF, VOR…can be applied concurrently), installation instruction and tests have been followed, DGAC France considers that the use of a such installed GPS system for VFR primary navigation should be allowed.
response	Not accepted. VFR primary navigation is still navigation referring to landmarks, GNSS may support this. Please refer also to the response to comment #40.

comment	*74* comment by: *DGAC France* The paragraph 4 "Limitations" states that the "equipment must not be used for IFR operations". Therefore we suggest to add in paragraph 5 a placard stating « not to be used in IFR operation » or « GPS must be switched off during IFR operation ».
response	Not accepted. The equipment cannot be installed on IFR aircraft by means of a standard change (please ref to the response to comment #69). Please also refer to the response to comment #40.

comment	*92* comment by: *The Norwegian Air Sports Federation* The addition of CS-SC057a is strongly supported.
response	Noted. Please refer to the response to comment #40.

comment	*100* comment by: *CAA CZ* **1. CS-SC057a — Installation of a GPS system to enhance situational awareness and to**

support
VFR navigation (new)

a. Chapter 1: We recommend rewriting the initial description of this SC (Purpose) to be clearer on what system functions are covered by this SC. As we understand it, this SC itself probably enables to install a stand-alone GPS system without moving map part (that is subject to separate SC0052b). Further, it is also possible to concurrently install a system utilizing a combined GPS/VHF NAV/VHF COM receiver, possibly also in combination with a moving map system. Any combination of the mentioned NAV sensors, COM radio and Moving map elements is possible, but respective individual SCs covering their installation needs to be complied with.

Chapter 2: Unclear meaning/consequences of the applicability defined by the sentence: "ELA2 aircraft, also valid if combined with other above mentioned SCs". Does this mean that in case of combination with CS-SC052b final applicability/eligibility would be "ELA2 aircraft", not "Un-pressurised aircraft less than 2 721 kg (6 000 pounds MTOM)" as for standalone CS-SC052b?

response Noted.
Please refer to the response to comment #40.

comment *118* comment by: *Garmin International*

Subpart B, Standard Change CS-SC057a, Paragraph 3

Includes the following bullet "— The equipment to be installed must be authorised in accordance with one of the following EASA ETSO, or equivalent standards: …"

CS-SC052b, which allows for similar installation of VFR GNSS equipment in "Un-pressurised aircraft less than 2 721 kg (6 000 pounds) MTOM" does not have a similar requirement that the equipment must have ETSO. Additionally, while equipment meeting the listed ETSOs can be used for VFR navigation, the intended function of the listed ETSOs is to support IFR navigation. Consequently, it is unclear why CS-SC057a, whose focus is GPS for VFR navigation in ELA2 aircraft, is more restrictive than CS-SC052b.

Suggest removing the ETSO requirement in CS-SC057a.

response Accepted.
Please refer to the response to comment #40.

comment *119* comment by: *Garmin International*

Subpart B, Standard Change CS-SC057a, Paragraph 3

Includes the following bullet "— A data bus/data connectivity between the installed equipment and other equipment which is:"

This bullet is not consistent with the similar bullet in CS-SC052b paragraph 3. Suggest changing to "— Data connectivity with the installed equipment and other equipment which is:"

response | Accepted.
Please refer to the response to comment #40.

comment | *120* comment by: *Garmin International*

Subpart B, Standard Change CS-SC057a, Paragraph 5

The requirement for an AFMS is an unnecessary impediment to installation of GPS systems that enhance situational awareness and support VFR navigation.

FAA Advisory Circular AC 20-138D, including Change 1 and Change 2, Appendix 6 allow for a placard to be installed in lieu of requiring an AFMS. CS-SC057a paragraph 3 already requires installation of such placards.

Suggest that CS-SC057a should be fully aligned with AC 20-138D Appendix 6 to maximize the safety benefits that will be achieved from installation of GPS systems that enhance situational awareness and support VFR navigation. At a minimum, allow either placard(s) or AFMS but do not require both.

Additionally, rather than the very specific requirements for AFMS contents, it would seem more appropriate to simply reference “the equipment instructions for operation, as required” as is allowed by CS-SC002b for Mode S.

response | Noted.
Please refer to the response to comment #40.

comment | *141* comment by: *JP Avionics*

Please remove the all integrated databases must be current statement. This will cause excessive burden and costs for users. Please note some units have multiple databases an the system is limited to VFR only / no primary navigation / Advisory only.

response | Partially accepted.
The wording has been amended to clarify that only the relevant databases must be current.
Please refer also to the response to comment #40.

3. Proposed amendments - Standard Change CS-SC058a p. 26-27

comment | *25* comment by: *Royal Netherlands Aviation Organisation*

Intgrate the CS-FLARM into CS TABS with FLARM being a possible TAB System. Remark: atc or airfields can also install FLARM receivers and track FLARM equipped aircraft (if they feel there is a use to it).

The TABS system from this CS gives the impression to be similar to FLARM

response	Not Accepted. FLARM does not fulfil the specification requirements of TABS as currently defined.

comment	*75* comment by: *DGAC France* Paragraph 3 : To be consistent with SC052, the following item should be modified as follows : « ~~A data bus/~~data connectivity ~~between~~ with the TABS device installed and other equipment which is: ~~- ETSO authorised (or equivalent); or~~ - required by TCDS, AFM or POH; or - required by other applicable requirements such as those for operations and airspace; or - mandated by the respective minimum equipment list (MEL), if this exists, »
response	Accepted. The text has been amended accordingly.

comment	*84* comment by: *Trig Avionics Limited* We support this change because Trig is developing TABS equipment, but the drafting does not currently reflect planned equipment. The issue is one of language rather than technical intent, in particular the reference to a TABS device, implying that TABS is a single item. The TABS acronym describes a system that implements four functions – the transponder function, the altitude source function, the ADS-B Out function, and the position source function. For each of these four functions the TABS equipment can either implement a fully TSO compliant capability, or can implement the alternate MOPS described in TSO-C199. Although TSO-C199 A1.2.8.1 includes the note that an “ideal” TABS implementation would comprise a single integrated unit, there is nothing in TSO-C199 that requires that the system is implemented as a single device. For example one solution from Trig will comprise the TC20 combined controller and altitude encoder, the TT21 transponder with ADS-B Out, and the TN72 position source – a 3 box implementation. Our experience tells us that in smaller airframes and gliders this is a popular solution because it allows the installer to make best use of available space. We therefore propose editorial changes at various points where the TABS is described as a single device. For individual features of the TABS specification the implementer can either implement the applicable TABS class (Class A or Class B), or can implement the equivalent TSO, therefore different TABS solutions may have different levels of compliance. We therefore propose editorial changes for “do not meet” phrases into “may not meet”, and additional guidance should be provided. Detailed proposed changes are as follows: Replace “TABS devices do not meet the transponder or ADS-B requirements defined in European Commission Implementing Regulations (EU) No 1206/2011 and (EU) No 1207/2011, therefore, this TABS installation is not sufficient to fly into transponder mandatory zones (TMZ).”, with “TABS devices **may** not meet the transponder or ADS-B requirements defined in European Commission Implementing Regulations (EU) No

	1206/2011 and (EU) No 1207/2011, therefore, this TABS installation **may** not be sufficient to fly into transponder mandatory zones (TMZ)." Add additional guidance text along the lines of: "If the transponder component of the TABS meets the transponder requirements refer to CS-SC002b." Because the ETSO does not yet exist, replace "The equipment is authorised according to ETSO-2C199" with "The equipment is authorised according to ETSO-2C199 **or FAA TSO-C199**". Replace "A data bus/data connectivity between the TABS device and other equipment which is:" with "A data bus/data connectivity between the TABS **equipment** and other equipment which is:" Replace "Any limitation defined by the manufacturer of the TABS device", with "Any limitation defined by the manufacturer of the TABS **equipment**." The requirement to fit a placard "For situational awareness only" for a system that does not include ADS-B in functionality is ambiguous. Something that tells the pilot what capability the system has would be more useful. Examples might be "No Mode A", or "Limited ADS-B", depending on which features are implemented.
response	Partially Accepted. The proposed wording has been significantly improved as suggested by the commentator. The reference to FAA TSO has not been accepted because as soon as the ETSO is published it will be considered as an equivalent to FAA TSO.

comment	*101* comment by: *CAA CZ* **1. CS-SC058a — Installation of traffic awareness beacon system (TABS) equipment (new)** a. <u>Chapter 1:</u> Please consider changing list of equipment like this: "… — traffic advisory system (TAS); **or** — traffic alert and collision avoidance system I (TCAS I); **or** — traffic alert and collision avoidance system II, (TCAS II), ~~**and**~~ **or** — ADS-B IN capability."
response	Accepted. The text has been amended accordingly.

comment	*121* comment by: *Garmin International*

Subpart B, Standard Change CS-SC058a, Paragraph 1

The first paragraph states, “TABS devices are intended for voluntary equipage on aircraft not required to carry a transponder or automatic dependent surveillance - broadcast (ADS-B) equipment. TABS devices do not meet the transponder or ADS-B requirements defined in European Commission Implementing Regulations (EU) No 1206/2011 and (EU) No 1207/2011, therefore, this TABS installation is not sufficient to fly into transponder mandatory zones (TMZ).”

This comment is related to another Garmin comment made for CS-SC002b, Paragraph 3. CS-SC058a, Paragraph 1 quoted above does not adequately consider the installation of a TABS position source with a Mode S transponder capable of transmitting ADS-B. It is clear from this CS that the voluntary transmission of ADS-B data by aircraft that are not required to meet (EU) 1207/2011 is acceptable when requirements defined by ETSO-2C199 are met. There is no clear reason why such voluntary transmission should be limited to TABS transmit equipment. A Mode S transponder with ADS-B transmit capability, paired with a TABS position source, can meet the same requirements as the TABS transmitter paired with TABS position source. The following is suggested as a replacement for the item quoted above:

"TABS transmit equipment is intended for voluntary equipage on aircraft not required to carry a transponder. TABS transmit devices do not meet the elementary surveillance requirements of Commission Implementing Regulation (EU) 1207/2011. Therefore, a TABS transmit device installation is not sufficient to fly into transponder mandatory zones (TMZ). TABS position source equipment is intended for voluntary equipage on aircraft not required to carry automatic dependent surveillance – broadcast (ADS-B) equipment. TABS position source devices do not meet the ADS-B position source requirements of Commission Implementing Regulation (EU) 1207/2011. CS-SC002b may be applied concurrently with this CS for the installation of a TABS position source."

response

Partially accepted.
Please refer to the response to comment #84.

comment

122 comment by: *Garmin International*

Subpart B, Standard Change CS-SC058a, Paragraph 1

The second paragraph states, “The installation of a TABS will enable an aircraft to be visible to air navigation service providers and other aircraft equipped with:”

This assumes that TABS installations always will include a transmit device and does not consider a TABS position source installed with a Mode S transponder. The following is suggested as a replacement for the item quoted above:

"The installation of a TABS position source with a TABS transmit device or a Mode S transponder with ADS-B transmit capability will enable an aircraft to be visible to air navigation service providers and other aircraft equipped with:"

response	Not accepted. The intent of the TABS is to ensure that the aircraft is visible. For the purpose of CS-STAN, this is independent of whether the TABS is integrated with a Mode-S transponder or if it includes its own transmition device.

comment	*123* comment by: *Garmin International* Subpart B, Standard Change CS-SC058a, Paragraph 3 Includes the following bullet "— A data bus/data connectivity between the TABS device and other equipment which is:" This bullet is not consistent with the similar bullet in CS-SC052b paragraph 3. Suggest changing to "— Data connectivity with the TABS device and other equipment which is:"
response	Accepted. Please refer to the response to comment #75.

comment	*124* comment by: *Garmin International* Subpart B, Standard Change CS-SC058a, Paragraph 3 Includes a requirement for data bus/data connectivity which is: "ETSO authorised (or equivalent); or" This bullet is not consistent with the data connectivity requirements in CS-SC052b paragraph 3, which proposes to remove the ETSO text, and CS-SC057a, which does not include the ETSO text. Suggest removing "ETSO authorised (or equivalent); or" from CS-SC058a.
response	Accepted. Please refer to the response to comment #75.

comment	*125* comment by: *Garmin International* Subpart B, Standard Change CS-SC058a, Paragraph 5 The requirement for an AFMS is an unnecessary impediment to installation of TABS. FAA currently has no AC covering TABS; hence, no AFMS requirement. Furthermore, the TABS AFMS requirements are more substantial than those required by CS-SC002b for installation of Modes S ELS. Suggest that CS-SC058a should remove the AFMS requirement. At the very least the CS-SC058a requirement for AFMS should be aligned with the CS-SC002b AFMS requirement.
response	Not accepted. The requirement is not overly demanding.

3. Proposed amendments - Standard Change CS-SC081a p. 28

comment	*26* comment by: *Royal Netherlands Aviation Organisation* Under 3 methods Details which are common knowledge for maintenance staff? under 6 As far as gliders are concerned this can be pilot owner maintenance
response	Noted. Please refer to the response to comment #108.

comment	*76* comment by: *DGAC France* Considering the purpose of this change, the Applicability/Eligibility should be extended to ELA1 aeroplanes. Therefore it is proposed to rewrite the paragraph as follows: "2. Applicability/Eligibility: ELA 1 aircraft, sailplanes and powered sailplanes."
response	Not accepted. This SC has been drafted specifically for sailplanes, including powered sailplanes.

comment	*93* comment by: *The Norwegian Air Sports Federation* NLF supports the addition of CS-SC081a. However, to replace a tyre and inner tube belongs to the tasks included in the list of pilot-owner maintenance tasks according to Part-M. Therefore, the SC release to service should be possible by the pilot-owner.
response	Noted. Please refer to the response to comment #108.

comment	*112* comment by: *René Meier, Europe Air Sports* Standard Change CS-SC081a Exchange of tyres... page 27/56 Release to service after exchanging tyres (inner tubes/outer tyres), sailplanes and powered sailplanes is, in our view, fully suitable for a release to service by the pilot-owner. Rationale Within the communities of sailplanes/powered saiplanes operators experienced pilot-owners for sure dispose of the required knowledge and skills to do the work this SC describes. Not granting the privilege to release an affected aircraft to service does not fit with the general idea of reducing the burden on GA pilot-owners.
response	Noted. Please refer to response to comment #108.

3. Proposed amendments - Standard Change CS-SC082a p. 29-30

comment	*27* comment by: *Royal Netherlands Aviation Organisation* Why this CS? Seems superfluous. All that is described in this CS is common practice in glider maintenance. 6 This is suitabel for POM. (?? Isn't it already listed as such in M.A. 803)
response	Noted. This is to cover the cases where the existing approved data does not allow for such changes.

comment	*127* comment by: *René Meier, Europe Air Sports* Standard Change CS-SC082a Exchange of skids on wingtips/fuselage tails page 29/57 We kindly ask the Agency to change the conclusion at the end of CS-SC082a to "This SC is suitable for release to service by the pilot-owner". Rationale In our view this is a simple aircraft maintenance task requiring the correct materials, precision and skills individuals in our communities dispose of. All the details you provide in your text read like a "how to exchange skids instruction" and are easy to understand. We do not understand why you come to the conclusion that a release to service after such an exchange is not suitable for a pilot-owner release to service.
response	Noted. Please refer to the response to comment #108.

comment	*158* comment by: *European Sailplane Manufacturers* Under point 1 the wording “exchange a rubber skid by” needs to be modified into “exchange **of** a rubber skid by”. At the end of point 3 the wording “Additionally, a weight and balance report should show that the aircraft…” needs to be replaced by “Additionally, a weight and balance report should **be completed to** show that the aircraft…”
response	Accepted. Adjustments have been introduced in the SC.

3. Proposed amendments - Standard Change CS-SC083a p. 31

comment	*28* comment by: *Royal Netherlands Aviation Organisation* In fact this CS resolves quite a lot of "grey". However sealing of control surfaces is covered in the repair manual by Hänle, which is already accepted as Acceptable means of compliance by the agency in the ezosting CS-STAN and is also endorsed by most TC holders as acceptable means and method to repair/ maintain gliders.

	Under 3 last sentence: The CS refers to "NEW Skids". Is this sentance misplaced perhaps from the CS "replacing skids".
response	Partially accepted. Although it is already partially covered by the existing Standard Repair, EASA is of the opinion that this new Standard Change will be useful. The typo has been corrected.

comment	*33* comment by: *Stu Hoy, Anglia Sailplanes* The last word of paragraph 3 is 'skids', this is wrong it should read 'seals': ...flight controls is not impaired by the new seals.
response	Accepted. SKIDS has been replaced with SEALS.

comment	*77* comment by: *DGAC France* The paragraph 1 should be modified as follows : « 1. Purpose ~~This SC is intended to allow exchange of flexible seals as installed on control surfaces on wings and empennages.~~ This SC is intended to allow exchange of flexible seals as installed on control surfaces on wings and empennages and/or to change the joint means of the seal (e.g. use of screws/bolts instead of glue-type joint). »
response	Accepted. Purpose has been amended.

comment	*86* comment by: *DGAC France* To be consistent with others SC and considering that this SC should covered all ELA 1 aircraft, DGAC France suggest to rewrite paragraph 2 as follow : "ELA 1 aircraft, Sailplanes and powered sailplanes~~, LSA and VLA~~"
response	Accepted. Applicability has been extended to ELA1.

comment	*102* comment by: *CAA CZ* **1. CS-SC083a — Exchange of flexible seals on control surfaces (new)** Chapter 3: Please consider wording change: "Additionally, verify that the movement of the flight controls is not impaired by the new ~~**skids**~~ **seals**."
response	Accepted. SKIDS has been replaced with SEALS.

comment	*128* comment by: *René Meier, Europe Air Sports* Standard Change CS-SC083a

Exchange of flexible seals on control surfaces
page 31/56

We kindly ask the Agency to change the conclusion at the end of CS-SC083a
to "This SC is suitable for release to service by the pilot-owner".

Rationale
The same as for CS-SC082a: In our view this is a simple aircraft maintenance task requiring the correct materials, precision and skills individuals in our communities dispose of. All the details you provide in your text read like a "how to do instruction" and are easy to understand. We do not understand why you come to the conclusion that a release to service after such an exchange is not suitable for a pilot-owner release to service.

response: Noted.
Please refer to the response to comment #108.

comment *159* comment by: *European Sailplane Manufacturers*

Within point 3 the wording “When changing towards a Mylar-type of seal (or a metal seal), it is recommended to test that the Mylar tape (metal strip) is ….” needs to be replaced by “When changing towards a Mylar-type of seal (or a metal seal), it is recommended to test that the Mylar tape (**or the** metal strip) is…”.

response: Accepted.
The text has been amended.

3. Proposed amendments - Standard Change CS-SC102a p. 32-33

comment *12* comment by: *Samionics / General Aviation Avionics*

CS STAN.40
Referenced documents. We see several references to FAA documents and proposed CS-SC102a installation of dc power supplies will also require an ELA electrical load analysis.

Doesnt all exchange/installations require an ELA?

We would like to see a requirement that compliance is also listed for the affected CS-2x paragraphs. Ie. Piper PA28 series, CS-23 aircraft thus ELA requirement would be introduced automatically (CS-23.1351 (a) electrial system capacity). One important paragraph is CS23-561, emergency landing conditions which today totaly ignored.

Actually initially we thought that CS-STAN required the showing of compliance with the appropriate CS category - EASA form 123

Completion instructions
6. ... **documents recording the showing of compliance with the Certification Specifications** or any test result...

response: Noted.

	The purpose of CS-STAN is to limit design changes that can be incorporated, not affecting safety but without necessarily fulfilling full aircraft certification specification. In this specific case an electrical load analysis has been requested by EASA in consideration of AC 43-13 and the potential effects on the electrical system.
comment	*29* comment by: *Royal Netherlands Aviation Organisation* 3 applicable methods: quite a lot of detail. It applies to all electric/ electronic equipment installed at anytime and anywhere. The detail are superfluous as they are a regular of the compence of the AML instlling the equipment. This SC like batteries, skids, tires, rudder sealing is a good example of rulesmakers trying to make extensive descriptions of work that is allowed. Mening everthing that is not allowed will require more SC's, more paper etc. Alternatively define generic SC's building on the knowledge skills and compentensies of Part 66 Staff and PART companies. Require that any change is well documented and is supported with an explanation that the modification/ workd done does not restrict / limit or jeopardizes airworhiness. (the one A-4 does all concept).
response	Not accepted. EASA has taken the approach to specify the minimum considerations to be given for each Standard Change and Repair since it cannot be pre-assumed that design standards are known by all the possible installers.
comment	*50* comment by: *Luftfahrt-Bundesamt* <u>LBA comment</u> 3. first dash: Remove: “Section 15 (on bonding)” Add: “For a general description and requirements for a DC-PSS see FAA AC 20-173 Chapter 5b. “Power Provisions” (1) – (4). That description is considered also applicable for PEDs other than EFBs. Types of CBs already used in other approved aircraft installations are also acceptable here.“ 3. below first dash: Remove: “The following standards ….” 3. second dash: Remove completely First bullet on first page: Add a note: “CBs have a certain trip time. Consider that a short circuit may cause a voltage notch before the CB trips.” Last non-solid bullet on first page: What has the DC-PSS to do with outside view? Second page, last bullet: Replace existing text by: “After installation a full aircraft EMI test is desirable. If the system includes a DC-DC converter that test is mandatory.” Second page, first dash: Replace existing sentence by: “If the installed system includes a DC-DC converter it shall have been authorized according to J/E/TSO-c71.”

response

Partially accepted.

3. first dash: Accepted.
The text has been amended accordingly.

Proposed additions: Not accepted.
AMC 20-25 Section 6.1.1.1.3, which is the EASA equivalent to FAA AC 20-173 Chapter 5b, has been considered and all the requirements applicable to this has been included in the standard change.

Removal of "The following standards ….": Not accepted.
This is the standard wording used within CS-STAN.

Note on first bullet point on the first page: not accepted.
The technicians in charge of this kind of SCs are supposed to be familiar with the use and performances of CBs.

Last non-solid bullet on first page: Noted.
This provision is included to prevent installation of power supplies and PEDs in areas where they could impair the external view of the pilot.

Text replacement on Second page, last bullet: Accepted.
The text has been modified to include a mandatory EMI aircraft testing after installation.

Text replacement on Second page, first dash: Not Accepted.
The existing requirements are sufficient to allow for a safe installation. An additional requirement for TSO is not considered necessary.

comment

103 comment by: *CAA CZ*

1. CS-SC102a — Installation of DC power supply systems (PSS) for portable electronic devices
(PED) (new)

a. Chapter 1: Please consider wording change: "Installation of DC power supply systems (DC-PSS) which connect ~~**aeroplane**~~ **aircraft** electrical power to portable electronic devices (PED)."

b. Chapter 3: The SC requires, that "the equipment shall be qualified to appropriate standard (e.g. EUROCAE ED-14/RTCA DO-160) to ensure that the levels of conducted and radiated interference generated by the PSS do not cause an unacceptable degradation of performance of essential systems or equipment". It is not clear, which particular EUROCAE ED-14/RTCA DO-160 test and category shall be met.

Chapter 3: What components of PSS are expected to have applicable ETSO/JTSO or equivalent?

response

Accepted
a) Accepted.
The text has been amended accordingly.

	b) Accepted. The paragraph has been removed and substituted by EMI test requirement in accordance with FAA AC 43.13-1B, Chapter 11. Chapter 3: Noted. No TSO is mandatory so the provision has been removed.

comment	*134* comment by: *JP Avionics* Exclude circuit breaker which are designed as *circuitbreaker switch* from list of not acceptable switches. This are designed to be switched so should be acceptable. Please change the equipment shall be qualified to appropriate standard to the equipment shall be tested agains appropriate standard.
response	Accepted. The text has been amended accordingly.

3. Proposed amendments - Standard Change CS-SC103a p. 34-35

comment	*78* comment by: *DGAC France* For aircraft that have been certified against CAR3 requirements, materials used in the construction of seat cushions must be flash resistant and not flame resistant. Therefore, flame resistance requirements should not apply to them. FAA AC 43.13-1B chapter 9 contains acceptable data for all aircraft and should be referred to in this SC. Nonetheless, it should be recommended to use flame resistant materials for these aircraft. The required flame resistant demonstration is a significant burden, adding costs for GA products certified against CAR3 requirements.
response	Not accepted. EASA tried to keep this standard as simple as possible without addressing specific cases of aircraft certified according to 'old' standard. Additionally the material which is currently available om the market is expected to meet the criteria as specified in CS-STAN. On the other hand, pilot owners still have the possibility to use approved spare parts or apply for minor changes.

comment	*79* comment by: *DGAC France* The DGAC France has no concern for all FAR/CS23 certified aircraft to use FAA AC 23-2A to demonstrate "flame resistant" capability of the material used.
response	Noted.

comment	*80* comment by: *DGAC France* Do you confirm that either the material manufacturer or the person carrying out this SC is authorized to perform the "Flame resistant" test as proposed in paragraph 3 of this SC?

response	Noted. Yes, 'Flame Resistant' characteristics can be demonstrated by the material manufacturer (by means of specific reference test) or by the technician carrying out this SC.

comment	*81* comment by: *DGAC France* Paragraph 3 of this SC provides additional information to the SC152a about seat cushions. These information clarify the acceptable methods, techniques and practice that can be used and therefore DGAC France suggests to align the SC152a wording with this new SC.
response	Partially Accepted. This proposal has been retained for consideration during the preparation of the next amendment of CS-STAN.

3. Proposed amendments - Standard Change CS-SC104a p. 36-37

comment	*51* comment by: *Luftfahrt-Bundesamt* LBA comment 3. pre-last dash and following table It is not realistic that the installer verifies ED requirements – especially with complicated exemptions. That is beyond the general intention of CS-STAN. In reality such requirements will be simply ignored.
response	Accepted. Please refer to the response to comment #133.

comment	*104* comment by: *CAA CZ* **1. CS-SC104a – Installation of lightweight in-flight recording systems (new)** a. Chapter 3: Please correct the sentence: "Equipment antennas are either internal to the equipment or are installed in accordance with the appropriate ~~**CS**~~ **SC"**. Chapter 3: We recommend to add crashworthiness requirements for mounting of the recorder here, similar as for CS-SC403a ("For cameras mounted inside the aircraft and behind occupants a pull test in the direction of flight…").
response	Partially accepted. 'CS' reference has been removed. The crashworthiness requirements are partially covered by FAA Advisory Circular AC 43.13-2B. In addition the allowed maximum weight is very low.

comment	*133* comment by: *JP Avionics* Please increase maximum weight of the units, 250 gram is to low. For example L3 Lightweight recorder for GA is 2,3 Kg. A weight of 5 Kg would be more suitable. Installation could be limited to installation on baggage floor, which can bear this load. Baggage load

would be reduced by recorder load.

We would propose that exclusively own sensors is changed to using exclusively own sensors under CS-SC104 with the option for external sensors, for which further approval would be required.

Remove the requirements and linkage to EUROCAE ED-155.

response

Partially accepted.
Regarding the weight:
The maximum weight has been increased to 300 g, this value does not include the mounting.

Regarding the sensors:
If the in-flight recording equipment would be connected to some aircraft sensors, it might disturb the functioning of these sensors, which, in turn, could deprive aircraft systems and instruments of data needed for piloting or navigating. EASA was made aware that this issue actually occurred with one model of in-flight recording equipment. Hence, the installation of an in-flight recording system connected to aircraft sensors cannot be done under a standard change.

Regarding the link to EUROCAE ED-155
Reference to ED-155 has been removed and substituted by a written statement from the equipment manufacturer.

comment *146* comment by: *Selfly*

Max weight is specified as not to exceed 250gr. I would suggest to increase it to at least 1000gr to allow for more survivability. Please note that an ordinary GoPro camera already weighs 147gr including casing.

response

Partially Accepted.
Please refer to the response to comment #133.

comment *160* comment by: *European Sailplane Manufacturers*

The limitation to max. 250 g under point 3 might be too tight? We have no information about such systems / devices but perhaps here a little higher value avoids the risk that the recording system cannot be mounted based on this SC.

response

Partially Accepted.
Please refer to the response to comment #133.

3. Proposed amendments - Standard Change CS-SC205a p. 42-43

comment *52* comment by: *Luftfahrt-Bundesamt*

LBA comment

Exact reference to AC43-13, Chapter 8, section 2, “Fuel Systems” should be made.
It is questionable if a VFR restriction would alter the risk situation. The indicator is already

	placarded “For situational awareness only”.
response	Partially Accepted. The exact reference to AC 43.13-1B Chapter 8, Section 2, ‘Fuel Systems’ has been made. At this stage, the VFR restriction is retained.

comment	*82* comment by: *DGAC France* To be consistent with SC032 wording, and to clarify that this SC does not cover the exchange of the installed certified fuel mesarurement system, DGAC France suggests to modify the paragraph 1 by adding the following sentence : “Exchange of FLLS is not covered by this SC”. In addition, DGAC France suggest to modify the following paragraph as follows : “Installation of the FLLS shall be done such that the caution amber light to be installed on the instrument panel is triggered when the remaining usable fuel quantity per tank reaches the quantity needed for running the engine not less than 30 minutes ~~(approximately)~~ at maximum continuous power per tank;”
response	Accepted. The text has been amended accordingly.

comment	*85* comment by: *CAA Denmark* Standard Change CS-SC205a Installation of Fuel Low Level Sensor (FLLS): Refers to AC 43.13-1B and AC 43.13-2B, but none of these deals with installation of sensors in the fuel tanks. When AC 43.13-2B not cover this change, it seems risky to regard change as a standard change unless installing a professional design including installation instructions. This change is considered to be too complex to be described as a standard change. Also, in connection with installation of sensors in the fuel tanks, not all aircraft are suitable for this change because there might be a risk of drilling in primary structure for the purpose of finding a correct position for the sensors. This, in order to avoid to large indication deviation in the different flight segments, climb, cruise and descent. In addition the installation could increase the risk of fuel leak in connection with an accident
response	Partially Accepted. AC 43.13-1B Chapter 8, Section 2, ‘Fuel Systems’ provides installation precaution/good practice for installation of fuel system equipment. The full reference has been included in the text of this SC. To reduce the complexity, EASA has limited applicability to ELA1 aircraft certified for VFR only. EASA has evaluated the potential risk of fuel leak in connection with an accident, this potential risk should be properly mitigated by the use of FAA AC 43.13 guidance and the other provisions in paragraph 3. The purpose of this SC has been reduced to mitigate the risk of drilling in primary structures by excluding integral fuel tanks. In addition, this SC is not suitable for release to service by the pilot-owner.

comment	*161* comment by: *European Sailplane Manufacturers* Under point 1 the last words "…for aircraft not already equipped with similar system." should be amended with "…for aircraft not already equipped with **a** similar system." Furthermore, the applicability should be also for powered sailplanes.
response	Accepted. The text has been amended accordingly.

3. Proposed amendments - Standard Change CS-SC251b p. 44-45

comment	*126* comment by: *Garmin International* Subpart B, Standard Change CS-SC251b, Paragraph 5 The requirement for an AFMS is an unnecessary impediment to installation of an angle of attack (AOA) indicator system. FAA Memo AIR100-14-110-PM01 makes no mention of an AFMS. Instead, AIR100-14-110-PM01 paragraph 2.c.(5) indicates a placard is sufficient. Suggest that CS-SC251b should be further aligned with AIR100-14-110-PM01 to maximize the safety benefits that will be achieved from installation of AOA indicator systems. At a minimum, allow either placard(s) or AFMS but do not require both. Additionally, rather than the very specific requirements for AFMS contents, it would seem more appropriate to simply reference "the equipment instructions for operation, as required" as is allowed by CS-SC002b for Mode S.
response	Not accepted. There is no change in respect to AFMS compared to the CS-SC251a and it has been found that an AFMS clearly giving information on limitations and procedures is helpful for the pilot for preparation of flights. However, the reference to the emergency procedures has been deleted since the equipment is for situational awareness only.

3. Proposed amendments - Standard Change CS-SC401b p. 46-47

comment	*6* comment by: *Samionics / General Aviation Avionics* 2. Applicability This section should include CS-27 category helicopters. We are able to exchange the attitude indicator in an aeroplane Piper PA46 Jetprop single engine turbo prop pressurised cabin max altitude fl 270... ...but not in a Robinsson R22 two seated piston engine VFR helicopter? We recently had a case regarding a electromechanical attitude indicator that was no longer

	serviceable. Solution is to install a new indicator (same manufacturer but different p/n) basically plug in replacement but this would require an EASA minor change approval - makes no sense.
response	Accepted. The applicability of this SC has been extended to cover rotorcraft not being complex motor-powered aircraft with single piston engine and limited to VFR day only

comment	*30* comment by: *Royal Netherlands Aviation Organisation* 1 Purpose: Why are digital multifunction displays excluded?
response	Noted. Digital multifunction displays are considered too complex for CS-STAN. Additionally, simultaneous loss of multiple functions could result in a higher risk for safety.

comment	*53* comment by: *Luftfahrt-Bundesamt* <u>LBA comment</u> 1. below the last dash The new sentence together with the one before is misleading. Replace it by: “The combination of a mechanical slip/skid indicator and a gyro based instrument does not constitute a multifunction display.”
response	Accepted. The wording has been improved.

comment	*130* comment by: *René Meier, Europe Air Sports* Standard Change CS-SC401b Exchange of basic flight instruments page 46/56 Applicability, proposal: Sailplanes and powered sailplanes should be dealt with separately, may we propose the creation of a separate CS-SC for these aircraft? Rationale Considering the construction details and the complexity of sailplanes a separate CS-SC is justified. The "release to service" should then be changed to "suitable for release to service by the pilot-owner": He/she is responsible for the aircraft, tasks therefore will be executed correctly.
response	Not Accepted. Please refer to the response to comment #108.

comment	*147* comment by: *Niklas Larsson - Member of GA Task Force, representing AOPA Sweden* *"This SC does not entitle the installation of digital multifunction displays."*

	Today we have a revolution of very nice and user friendly multifunction instruments. You can have one instrument that includes the whole classic six pack! This is great and something that we should encourage owners to upgrade to if they want. You should reconsider this sentence and remove it, this is a true step forward in terms of flight safety and we should encourage this development.
response	Not accepted. Such installation should be done in a more controlled manner, for instance through an STCs.

3. Proposed amendments - Standard Change CS-SC403a p. 48-49

comment	*15* comment by: *Jonathan Lawrence* With respect to the UK CAA's maximum weight of camera and mount of 250g, I wish to point out that the most common method of mounting small cameras in the cockpit is by using a GoPro camera and suction-cup mount, which all adds up to a weight of 300g. This regulation would effectively outlaw the most common method of filming in GA cockpits.
response	Accepted. The wording has been changed accordingly.

comment	*31* comment by: *Royal Netherlands Aviation Organisation* 2 applicability: only ELA 2 or also ELA 1 including gliders/TMG?? After reading the various preceeding CS's: Is it EASA's expectation / intention/ believe, that al GA (gliders) already including many of the listed CS's are in retrospect going to fill out form 123s to legalise equipment and modifications that have been in use for a number of years to total satisfaction without causing any safety hazard ??? If so the consequences are that we are all busy with paper (EASA writing and publishing CS's, owners writing Form 123's, AML writing CRS). We are all busy, but not making aviation either saver or more fun!
response	Noted. ELA2 includes ELA1 in principle, and ELA1 includes sailplanes and powered sailplanes.

comment	*54* comment by: *Luftfahrt-Bundesamt* <u>LBA comment</u> Section 3 -Acceptable methods, techniques, and practices - In case of unintentional detachment of the installation it must be ensured, that no parts can impact in or jam any critical part or system of the aircraft. Explanation for this comment: This is also mentioned in the referenced material (CAA UK CAP 1369), but as far as alternative material may be used instead, it will be helpful to have a direct statement in here. - For cameras mounted inside the aircraft and behind **or above** occupants a pull test in the direction of flight **respectively in the direction of the occupants** for the primary mounting and the secondary retention, if applicable, shall be performed using at least 15 times the weight of the unit. - Push/Pull tests shall be performed for every mounting system and every applicable

	mounting position under consideration of the inertial forces (flight envelope, crash loads) and aerodynamic drag loads. Conservative assumptions shall be used for that. Explanation for this comment: Push/Pull tests are relatively simple to perform and provide a good awareness regarding the suitability of the installation. Section 4 -Limitations - Mounting on or interference with parts of the flight controls are excluded from this CS Explanation for this comment: The application of additional items of mass to the flight controls can change the dynamic properties of the system and can thus induce a risk of flutter. - No items with sharp edges shall be installed in the proximity of the head of any occupant. Explanation for this comment: It must be prevented, that occupants suffer any injuries due to contact with the camera installation at turbulent flight conditions or hard landings.
response	Partially Accepted. The wording has been changed accordingly. Special considerations for installations are already covered by CAA UK CAP 1369 which is now a mandated standard for this standard change. Regarding the extension of crashworthiness tests in the vertical direction, the relevance is only for balloons and rotorcraft.

comment	*162* comment by: *European Sailplane Manufacturers* We propose to include a caution about mounting of such a camera on control surfaces or possible influence upon control surfaces (e.g. wording similar to the flexible seal CS-SC083a, where the effects shall be tested in a first flight).
response	Accepted. Please refer to the response to comment #54.

3. Proposed amendments - Standard Repair CS-SR802b p. 51

comment	*105* comment by: *CAA CZ* **1. CS-SR802b — Repair of Sailplanes, Powered Sailplanes, LSA and VLA (amended)** There is missing link to the referenced document 'Manuel de Reparation Generique pour la Reparation Des Planeurs en Materiaux Composites R02-15-A01', indice B where the document can be obtained (Note 16).
response	Accepted. EASA contacted the FFVV to make this document available to third parties. FFVV confirmed that the document will be retrievable in their webpage. Conditions for obtaining the document are included in CS-STAN.

comment	*165* comment by: *FFVV* As part of the comments on CS STAN (NPA 2016-17) the FFVV would like the EASA to reference AC43-13 directly in CS-SR802a. The addition would be in paragraph 3: Acceptable methods, techniques and practices:

	FAA Advisory Circular AC 43-13-1B together with AC 43.13-2B, Chapter 4. Indeed this chapter of the AC 43 13 would be very useful to repair the gliders therefore the structure is in tube (glider type K8 or K13 ...).
response	Not Accepted. The use of AC 43-13-1B together with AC 43.13-2B is already allowed by CS-SR801a which is applicable to ELA2 aircraft which includes sailplanes or powered sailplanes with an MTOM up to 2 000 kg.

3. Proposed amendments - Standard Repair CS-SR802b p. 52

comment	*32* comment by: *Royal Netherlands Aviation Organisation* 6 release to serivice: See M.A. 803 which clearly states tha some repairs performed on the basis of referred documents ARE POM. The more paper, the more detailed rules, the more confusion (quite opposite to the goals).
response	Not Accepted Refer to response to comment #108

comment	*132* comment by: *DGAC France* DGAC France suggests to add the AC43-13 as part of paragraph 3 for an acceptable method: FAA Advisory Circular AC 43-13-1B together with AC 43.13-2B, Chapter 4. Indeed this chapter of the AC 43-13 would be very useful to repair gliders with tube structure for instance (glider type K8 or K13 ...).
response	Not Accepted. The use of AC 43-13-1B together with AC 43.13-2B is already allowed by CS-SR801a which is applicable to ELA2 aircraft which includes sailplanes or powered sailplanes with an MTOM up to 2 000 kg.

3. Proposed amendments - Standard Repair CS-SR803a p. 53

comment	*106* comment by: *CAA CZ* **1. CS-SR803a – Repairs of canopy cracks by drilling a stopping hole (new)** a. It would be more appropriate to name this repair: "**TEMPORARY** REPAIR OF CANOPY CRACKS BY DRILLING A STOPPING-HOLE". <u>Chapter 4:</u> Please consider correcting the wording: Initial sentence "Repair of a crack by drilling a stopping-hole is only permitted by this SR if" does not fit to the following text "after applying this SR any growth of the crack at the end of the stopping-hole is observed". This text should be standalone.

response | Accepted.
The text has been amended accordingly.

comment | *131* comment by: *René Meier, Europe Air Sports*

Standard Repair CS-SR803a
Repair of canopy cracks by drilling a stopping hole
page 53

We kindly ask the Agency to change the conclusion at the end of CS-SC803a
to "This SC is suitable for release to service by the pilot-owner".

Rationale
In our view this is a simple repair task requiring a suitable drilling equipment. Required precision and skills individuals in our communities dispose of. All the details you provide in your text read like a "how to do instruction" and are easy to understand. We therefore ask you change the status of this repair from "not suitable" to "suitable for a release to service by the pilot-owner" as he/she flies the aircaft, fully responsibe for the entire operation.

response | Not accepted
Please refer to the response to comment #108.

comment | *163* comment by: *European Sailplane Manufacturers*

Under point 3 it should read “The hole shall **not be larger than the approx.** thickness of the material (i.e. typically not larger than 2-3 mm diameter)…” and not “The hole shall not be smaller than the thickness of the material (i.e. typically not larger than 2-3 mm diameter)…”.

Under point 4 it should read “At the latest the final repair **should** be performed during the next aircraft annual inspection **(or 100h inspection in the case of aeroplanes)**.” instead of “At the latest the final repair shall be performed during the next aircraft annual inspection.”

The last (round) bullet under point 4 should read “after applying this SR **no** growth of the crack at the end of the stopping-hole is observed” instead of “after applying this SR any growth of the crack at the end of the stopping-hole is observed.”

Under point 5 it should read “at the time of the next annual check **(or in the case of aeroplanes the next 100 hours inspection, whichever comes first)**.” instead of “at the time of the next annual check or 100 hours inspection, whichever comes first.”

response | Accepted
Text amended accordingly

3. Proposed amendments - Standard Repair CS-SR804a p. 54-55

comment | *9* comment by: *DAeC LV NRW e.V., Technischer Ausschuss*

The Technical Commitee (TA) of the Aeroclub NRW is very glad that its recommendation for this SR is included in the NPA 2016-17 amendment. We would like to use this comment form

to explain at length our proposal. We intend the entire substitution of conventional approved wood glue systems of the phenol-resorcinol resin (e.g. AERODUX 185) and urea-formaldehyde resin (e.g. Kaurit) types by compounds consisting of approved laminating epoxy resin types and admixture of Aerosil/cotton flocks in case of the repair of wooden structures.

These kind of compounds are actually used for bonding fiber composite parts with parts consisting of fiber composite or plywood for heavily loaded structure modules like wing spar stubs, rips and bulkheads (e.g. different types of Alexander-Schleicher-Segelflugzeugbau) and in case of wooden structures for bonding the covering of wings leading edges
Examples:

- LS 1 (EASA TCDS A.095): bonding of wing spar's plywood web
- SF 25 (EASA TCDS A.098): TM 653-3/76 "covering of wings leading edges"
- ASW 20 (LBA TCDS 314): TM 16 "Installation of a front towing hook"
- The Elfe S-4A (EASA.SAS.A.041) and the kit-sailplane type Elfe S-4D (LBA TCDS 298) were completely bonded by using the compound of “Rütapox L20” epoxy resin and cotton flocks.
- Grob Astir/Twin Astir (EASA TCDS A.250): TM 306/29 resp. TM 315-36 "Exchange of both end spar spigot assemblies"

Therefore positive practical experiences are available.

The working methods for preparing the wooden components for the bonding with epoxy resin compounds are identical to these in case of glueing with conventional wood glue systems above mentioned. Also the scarf joint ratios for plywood and solid wood joints remain unchanged. Only the kind of fixing and pressing the joint patch during curing are different. Regarding the mechanical strenght properties and the fatigue limits the epoxy glueing is superior to the conventional practise.

The proposed adhesive trademarks T-88 and Araldit 185 B are not suitable for processing according to the mentioned “General handling instructions for the use of epoxy resin compounds for the repair of wooden structures” (published by Aeroclub NRW) due to their thixotropy. Only the epoxy resin compounds specified in the above mentioned document should be used.

Therefore this SR should be applicable for all types of repairs of wooden structures. It is counterproductive to limit the application only to minor repairs because the parts which are bonded with epoxy resin compound couldn’t be bonded once again with conventional glue systems in case of major repairs. So we suggest to fix if one repair was executed by using epoxy resin compound, every following repair of this component must be performed with the same compound to avoid lack of adhesion.

response

Partially Accepted.
This SR has been substantially amended considering also other comments from stakeholders, please refer also to the response to comment #129.

The scope of this SR has been extended to cover all different kind of adhesives and not only epoxy resin.
Consequently the title of the SR has been changed to ‘Use of Alternative Adhesive for Repairs

	of ...' Additionally, the applicability of this SR is no longer limited to 'minor repairs'. The production within an approved production organisation has more possibilities and potentially a higher quality management system as compared to repairs performed in the field. Therefore, processes and materials accepted for production are not necessarily acceptable for repairs. Taking this into account, this SR has been limited and self-mixed resins which are not foreseen for repairs of wooden structure have not been included. The reference to the Aeroclub NRW document has been taken out of the SR. Instead, clear instructions on possible adhesives have been developed. All trademarks have been removed from the main text and added as a note at the end of the instructions.
comment	*55* comment by: *Luftfahrt-Bundesamt* LBA comment General At the time when the wooden gliders were built and certified no primary or secondary structure was defined. So today there is a grey area between primary or secondary structure which may lead to problems. Section 2: The handling instructions from Aeroclub NRW are not available Section 3: - Define exactly what are non-structural parts - Araldit is a sales name for a group of Epoxy resin system, a specification for the resin should be added. - Due to the temperature sensitivity of both materials all parts treated with resin must have a white color. => Add all parts treated with resin must have a white color - The curing temperature and the process of the heat treatment of the epoxy resin have to be considered - The epoxy resin must be heat treated otherwise the physical properties will be not reached.
response	Partially accepted. This SR has been substantially amended considering also the other comments submitted by stakeholders, please also refer to the response to comment #129. This SR does not refer to primary or secondary structures, the wording has been improved to clearly restrict its applicability. Reference to handling instructions from Aeroclub NRW has been removed. Structural parts which are not approved for repairs with epoxy resin not complying with EN 301 are listed directly. A clear provision has been introduced to limit the epoxy-bonded areas and a limitation to 50°C operating temperature has been added. This resulted in the indication to use the white colour and the need to use epoxy resin outside hot areas such as engine compartments. The reference to Araldit has been removed. Consideration on curing temperature has also been added.

comment	*83* comment by: *DGAC France* In paragraph 4, two adhesives are indicated “T-88 (18)” and “Araldit (19)”. But in note 19, “Araldit 185B” is noted. As Araldit 185B does not exist, DGAC France assumes that EASA initial intention was to mention "Aerodux 185B" instead. So DGAC France considers that it should be modified into “Aerodux 185B” in paragraph 4.
response	Accepted This SR has been substantially amended considering also the other comments submitted by stakeholders, please refer also to the response to comment #129. All the references to existing adhesives have been removed from the main text and a new note has been added at the end of the SR to list some existing adhesives. The Aerodux 185 adhesive is included in the note.

comment	*107* comment by: *CAA CZ* **1. CS-SR804a – Use of epoxy resin for the repair of aircrafts build with wood (new)** a. Link to the referenced document “General handling instructions for the use of epoxy adhesive for the repair of wood and wooden mixed structures form AEROCLUB|NRW” in Note 17 is not working and document cannot be found. Is this document a form (mistype)? Chapter 4: Please consider being more specific in wording of the text “structural skin on wing, fuselage and empennage, with less than 10 % of total component area is recommended”. Meant is obviously **damaged** area.
response	Partially Accepted. This SR has been substantially amended considering also the other comments submitted by stakeholders, please refer also to the response to comment #129. The link to NRW is no longer necessary and therefore it has been deleted. Not all damaged areas can be repaired using this SC-STAN SR, therefore the ‘less than 10 %’ limitation was necessary. Having extended to other kind of adhesives, the wording needed to be changed and it has been improved.