



European Union Aviation Safety Agency  
**Comment-Response Document (CRD) 2021-06**

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RELATED NPA: 2019-06 — RELATED ED DECISION: 2022/009/R — RMT.0690

27.4.2022

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## 1. Summary of the outcome of the consultation

During the public consultation of NPA 2021-06<sup>1</sup>, EASA received a total of 308 comments from 23 stakeholders. All commentators strongly supported the use of and regular updates to CS-STAN since it constitutes a good tool for general aviation (GA) to implement changes in a standardised and cost-effective manner with limited administrative burden.

The two most commented proposals were the following:

- Standard Change CS-SC005b *INSTALLATION OF AN ADS-B OUT SYSTEM COMBINED WITH A TRANSPONDER SYSTEM*, and
- Standard Change CS-SC057a *INSTALLATION OF AN ELECTRONIC CONSPICUITY (EC) FUNCTION*.

Both received in total over 25 % of all the comments. Most comments have resulted in EASA accepting the changes in the text of these standard changes (SCs), and the comments have contributed to the improvement of the quality and understanding of these SCs.

EASA wishes to thank all the commentators who have provided such important feedback.

### EASA Form 1

The addition of the information about the need (or not) of an EASA Form 1 with parts that are installed in a SC was appreciated. However, it also prompted comments and questions which show that some of the SCs introduced require more detailed explanation.

In the meantime, following the publication of EASA Opinion No 07/2019 'Instructions for continued airworthiness | Installation of parts and appliances that are released without an EASA Form 1 or equivalent'<sup>2</sup> on 18 December 2019, *Commission Delegated Regulation (EU) 2021/699* was published on 21 December 2020 amending and correcting Regulation (EU) No 748/2012 as regards the instructions for continued airworthiness, the production of parts to be used during maintenance and the consideration of ageing aircraft aspects during certification<sup>3</sup>. More information can be found on the dedicated EASA webpage<sup>4</sup>.

As explained in the NPA, EASA performed an analysis of the potential failure effects of the parts for each SC, and whether an undetected non-conformity of a part would have a negligible safety effect. Based on this analysis, it is stated in each SC which parts would therefore not require an EASA Form 1 for their release to service. The most important hurdle in relation to the issue of an EASA Form 1 for new parts is the fact that only an approved production organisation has the privilege to issue an EASA Form 1. The suggestion to require an ETSO authorisation for such parts, as alternative to an EASA Form 1, does not provide a solution since an organisation that holds an ETSO authorisation also needs to hold a production organisation approval (POA).

<sup>1</sup> NPA 2021-06 'Regular update of the Certification Specifications for Standard Changes and Standard Repairs — CS-STAN Issue 4' (<https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2021-06>).

<sup>2</sup> <https://www.easa.europa.eu/document-library/opinions/opinion-072019>

<sup>3</sup> OJ L 145, 28.4.2021, p. 1 (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0699>).

<sup>4</sup> <https://www.easa.europa.eu/document-library/regulations/commission-delegated-regulation-eu-2021699>

**CS STAN.07 Identification of technical/non-technical revisions**

The reconsideration of the proposed identification and split between technical and non-technical changes has led to the removal of this proposed split of identification from CS-STAN. Therefore, the proposed general point CS STAN.07 has not been retained, and the proposed non-technical changes have been kept but are indicated as normal revisions to standard changes (SCs).

**CS STAN.45 Flammability protection**

The proposed introduction of this point in NPA 2021-06 raised a comment regarding the rationale for this proposal, arguing that CS-STAN is intended to reduce the administrative burden for GA as regards the embodiment of simple changes and simple repairs. Considering this comment, and other comments raised on this proposed point, it became clear that the introduction of design-related details in CS STAN.45 would potentially create non-intended consequences regarding installer responsibilities. CS-STAN is not written to explain how to design a change, but to provide information in such a manner that it is suitable for the embodiment of simple changes and simple repairs by an installer that has the necessary competence and skills. Therefore, if needed, specific provisions addressing flammability issues will be included in the specific standard change or standard repair, as applicable. An example can be found in CS-SC103a *Exchange of interior material covering floor, sidewall and ceiling*, where information and checks are included to address flammability issues.



## 2. Individual comments and responses

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

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

### (General Comments)

-

comment

1

comment by: *AOPA Sweden*

AOPA Sweden

General comments on NPA 2021-06

AOPA Sweden support the work of EASA to simplify maintenance for General aviation and thereby make it less costly for aircraftowners and pilots. So we have not any objections to the NPA 2021-06.

Still, there are improvements that can be done and we urge EASA to continue the work of simplifying the rules for General aviation. One item that is worth mentioning is the amount of text produced. This NPA consist of 162 pages and I am fairly sure that most planeowners and pilots do not bother to read all pages. Not to forget all other NPA:s produced by EASA. Perhaps a short summary of the proposal is a good idea, pointing out the most important parts and and make it easier for the owners and pilots to implement the new systems.

Stockholm 21-04-10

Fredrik Brandel  
Member of the board  
AOPA Sweden

response

Noted

EASA is continuously working on simplifying the processes and at the same time improving the readability and clarity of the information provided. In this case, a very high number of already published standard changes was amended due to generic topics, like the release of parts without an EASA Form 1.

comment

2

comment by: *LBA*

LBA has no comments



response	Noted
comment	<p>4 <span style="float: right;">comment by: <i>DGAC France</i></span></p> <p>Consistency should be maintained throughout the entire document with regard to the use of the following wording : Suitable / Qualified suitable / Qualified ("qualified" is deemed as more appropriate)</p>
response	<p>Not accepted</p> <p>The intent was to consistently replace 'qualified' by 'suitable'. Nevertheless, some instances have been inadvertently overlooked, and will be consistently corrected in the final CS-STAN Issue 4.</p>
comment	<p>22 <span style="float: right;">comment by: <i>Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)</i></span></p> <p>Thank you for the opportunity to comment on NPA 2021-06 'Regular update of the Certification Specifications for Standard Changes and Standard Repairs — CS-STAN Issue'. Please be advised that there are no comments from the Swedish Transport Agency.</p>
response	Noted
comment	<p>39 <span style="float: right;">comment by: <i>KSAK - Swedish Royal Aero Club</i></span></p> <p>We thank EASA for their proactive work to make the regulatory burden better for general aviation. We appreciate this.</p> <p><b>Here we summarize our views of CS-STAN:</b></p> <p>Several of the proposed new Standard Changes (e.g. CS-SC208a and CS-SC210a) include the condition that</p> <p>"The installation of the XXX together with the related parts, has been certified by EASA or by a civil aviation authority of a third country that has entered into a bilateral agreement with the EU. The equipment manufacturer has declared that the XXX is suitable for installation on a specific aircraft and compatible with YYY. Moreover, the equipment manufacturer provides the necessary design data to the installer."</p> <p>or some similarly phrased condition.</p> <p>This is not much different from requiring an STC which will essentially make the SC pointless. We propose that in all SCs with this kind of condition, it is instead left to the installer to decide the suitability for installation on the specific aircraft or – at the very least – that the certification requirement is dropped.</p> <p>In general, we do not want to see any limitations on CS-STAN when it comes to going from VFR to IFR or just keeping IFR privileges. Almost all of these changes are done by professionals which means that the job will be done just as good as with an STC.</p>



	We need to make this happen to achieve light and better rules for general aviation in Europe.
response	Not accepted  This statement says that existing certified installations (TCs/STCs) can be applied as the <u>substantiation</u> for installation of multifunctional displays for power plant instruments in accordance with this standard change, provided the display is the suitable one. It does not mean the standard change needs approval.
comment	40 <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span>  These comments are made for AUFWIND GmbH by Malte Höltken, Member of SAB EM.TEC for iAOPA europe.  Aufwind appreciates this NPA and fully supports the effort of extending simpler modifications and repairs to General Aviation Aircraft, especially the clarification for parts eligible to be used without Form 1.
response	Noted
comment	81 <span style="float: right;">comment by: <i>DGAC France</i></span>  In some instances, specific SCs make reference to the use of JTSOs or ETSOs as acceptable methods to demonstrate compliance. Do all JTSOs require compliance with environmental standards (as ETSOs)? If not, equivalence between ETSOs and JTSOs does not seem relevant for these cases, and an additional mention to environmental standards may be required.
response	Noted  The referenced JTSO standards are the pre-EASA equipment standards that are the predecessors of the EASA ETSOs, and mostly include environmental qualifications, similar to the ETSOs. Any article approved or validated by any Member State before the establishment of EASA is deemed to be 'grandfathered' according to Article 6 of Commission Regulation (EU) No 748/2012 ( <a href="https://www.easa.europa.eu/the-agency/faqs/etso-authorisations">https://www.easa.europa.eu/the-agency/faqs/etso-authorisations</a> ).  The list of ETSO/JTSO authorisations is available on the EASA website ( <a href="https://www.easa.europa.eu/download/etso/etsoa.pdf">https://www.easa.europa.eu/download/etso/etsoa.pdf</a> ). JTSO articles are deemed to be 'grandfathered' within the scope of CS-STAN.
comment	145 <span style="float: right;">comment by: <i>Europe Air Sports</i></span>  Generally Issue 4 of CS-STAN is a very positive development, addressing items very relevant to General and Sports Aviation.
response	Noted
comment	146 <span style="float: right;">comment by: <i>Europe Air Sports</i></span>



response	<p>The CS-STAN Issue 4 defines a large number of installations of "stand-alone" or "add-on" equipment which are specifically not allowed to be connected to the aircraft's systems. While this certainly can add to the utility of especially older aircraft, this has the potential effect of creating multiple unconnected data flows, which might lead to confusion and related hazards.</p> <p>We would like to question if this is the ideal long term policy, or if it would be safer to ease the requirements for installation of equipment connected to and integrated with the aircraft's own systems. For example if a tracker device emits a GPS position different from an integrated ADS-B Out device, it may confuse tracking services. The integration could be done e.g. using well designed interface units that pass on data from the aircraft's systems to the additional devices in a fault tolerant manner which protects the aircraft's systems.</p>
response	<p>Noted</p> <p>There is no ideal long-term policy for this. The content of CS-STAN is driven by frequently encountered issues that users highlight via proposals and should of course fit within the controllability of the risk of such a change. When the change becomes too integrated, the number of interface issues might not be suitable for a Standard Change solution.</p>
comment	<p>171 <span style="float: right;">comment by: FFA EUR</span></p> <p><i>FFA-EUR thanks EASA for proposing a further upgrade of CS-STAN.</i></p> <p><i>CS-STAN, by reducing costs and simplifying the administrative process, is a major advance for GA.</i></p> <p><i>We support the evolution of the current wording, linked with the complexity of the new items proposed, which limits the risks of deviation by the necessary requirement to apply standards, methods and practices</i></p>
response	<p>Noted</p>
comment	<p>222 <span style="float: right;">comment by: FOCA Switzerland</span></p> <p>FOCA welcomes and fully supports the proposed revision of the CS-Stan. We also thank EASA for the opportunity to provide comments.</p>
response	<p>Noted</p>
comment	<p>297 <span style="float: right;">comment by: Swiss Aeroclub</span></p> <p>We thank you for giving us the opportunity to comment on NPA 2021-16.</p> <p>The Aeroclub of Switzerland fully supports and welcomes the present EASA initiative to reduce or eliminate unnecessary burdens imposed to General Aviation with no or only negligible effect to safety. Therefore, we are very satisfied with the content of NPA 2021-06 and trust that EASA will continue its work in the same spirit also in the future.</p>

response

Noted

comment

299

comment by: *FNAM*

FNAM (Fédération Nationale de l'Aviation Marchande) is the French Aviation Industry Federation/ Trade Association for Air Transport, gathering the following members:

CSTA: French Airlines Professional Union (incl. Air France)  
 SNEH: French Helicopters Operators Professional Union  
 CSAE: French Handling Operators Professional Union  
 GIPAG: French General Aviation Operators Professional Union  
 GPMA: French Ground Operations Operators Professional Union  
 EBAA France: French Business Airlines Professional Union

And the following associated members:

FPDC: French Drone Professional Union  
 UAF: French Airports Professional Union

The comments hereafter shall be considered as an identification of some of the major issues the French industry asks EASA to discuss with third-parties before any publication of the proposed regulation. In consequence, the following comments shall not be considered:

- As a recognition of the third-parties consultation process carried out by the European Parliament and of the Council;
- As an acceptance or an acknowledgement of the proposed regulation, as a whole or of any part of it;
- As exhaustive: the fact that some articles (or any part of them) are not commented does not mean the FNAM has (or may have) no comments about them, neither the FNAM accepts or acknowledges them. All the following comments are thus limited to our understanding of the effectively published proposed regulation, notwithstanding their consistency with any other pieces of regulation.

Introduction:

FNAM, GIPAG and SNEH thanks EASA for this proposal in CS-STAN domain. The NPA 2021-06 is welcome, and allows more flexibility for standard repairs or standard modifications.

However, we have some general comments on this consultation:

- The release to service of the aircraft which have been modified without an EASA Form 1 could have a significant impact for the flight safety. Thus, we proposed to





	<p>request an EASA Form 1 when the system is interconnected with other aircraft equipment.</p> <ul style="list-style-type: none"> <li>- Many CS STANs don't need an EASA Form 1 or ETSO cases are not required. We would like that at least ETSO are required for each piece of equipment installed. In the other direction, when there is no need for ETSO to specify it.</li> <li>- Sometimes definitions of EMIs are not made or present in different ways. Could it be possible to standardize EMIs in all CS STAN who need it?</li> <li>- ELA2 should be replace by Light Aeronef to be in line with regulatory changes.</li> <li>- Would it be possible to create a CS STAN for the removal of equipment as ADF, DME, etc? In fact, at this time, this type of request need to be done by a minor change request.</li> </ul>
response	<p>Noted</p> <ul style="list-style-type: none"> <li>— The analysis to determine the impact of an undetected non-conformity of a part with its design has been part of the preparation of the proposed standard changes. This analysis does not use the interconnection to other aircraft systems as a criterion to establish the need for an EASA Form 1.</li> </ul> <p>The impact of a non-conformity of a part has been analysed, and meets the criteria as provided in the GM for parts that are released without an EASA Form 1.</p> <p>For ELA1 and ELA2 aircraft, an undetected non-conformity has an effect less than or equal to:</p> <ul style="list-style-type: none"> <li>— a slight reduction in the operational or functional capabilities of the aircraft or its safety margins;</li> <li>— some physical discomfort to its occupants; or</li> <li>— a slight increase in the workload of the flight crew without requiring the use of emergency procedures.</li> </ul> <ul style="list-style-type: none"> <li>— An EASA ETSO authorisation in accordance with Part 21 Subpart O is an option, not an obligation, for the design and production of equipment. An ETSO authorisation basically requires an organisation to hold a production organisation approval (POA). This is considered too onerous for the production of all equipment, and impractical for non-aviation equipment.</li> <li>— Your proposal to make the EMI requirements more standardised across CS-STAN is certainly an idea that EASA will take onboard in future revisions.</li> <li>— ELA2 means a manned European light aircraft, as defined in Regulation (EU) No 748/2012. This cannot be changed in CS-STAN.</li> <li>— Creating a CS-STAN for the removal of superfluous equipment will be considered in future revisions of CS-STAN.</li> </ul>
comment	<p>306 <span style="float: right;">comment by: <i>European Powered Flying Union</i></span></p>



	As organisation representing powered flight we thank the Agency for having developed the remarkable set of standard changes and standard repairs. EASA's activities in this domain are highly appreciated.
response	Noted

### 1. About this NPA

p. 4

comment	296	comment by: <i>European Sailplane Manufacturers</i>
	<p>This is a general comment by the European Sailplane Manufacturers.</p> <p>The CS-STAN is a very much appreciated document which has been proven to be really useful for the General Aviation communities including the gliding world.</p> <p>We are happy to see this next iteration and look forward to any further emendmend and inclusion of useful SC and SR.</p> <p>Probably with introduction of the "Parts without Form 1" rules into Part-21 in the near future even more such useful SC /SR might be required (beyond the already included amendments) - here perhaps some dedicated new NPA might be needed as soon as first experience about this rule adaptation is gained.</p>	
response	Noted	

### 2.3. How we want to achieve it - overview of the proposals

p. 6

comment	23	comment by: <i>Uppsala Flying Club</i>
	<p>It is very good that EASA proposes new Standard Changes.</p> <p>However, several of the proposed new Standard Changes (e.g. CS-SC208a and CS-SC210a) include the condition that</p> <p>"The installation of the XXX together with the related parts, has been certified by EASA or by a civil aviation authority of a third country that has entered into a bilateral agreement with the EU. The equipment manufacturer has declared that the XXX is suitable for installation on a specific aircraft and compatible with YYY. Moreover, the equipment manufacturer provides the necessary design data to the installer."</p> <p>or some similarly phrased condition.</p> <p>This is not much different from requiring an STC which will essentially make the SC pointless. We propose that in all SCs with this kind of condition, it is instead left to the installer to decide the suitability for installation on the specific aircraft or – at the very least – that the certification requirement is dropped.</p>	
response	Not accepted	



This statement says that existing XXX installations (TCs/STCs) can be applied as the substantiation for installation of XXX in accordance with this standard change, provided the equipment is the suitable one.

comment 52 comment by: *Garmin International*

**2.3 Subpart B- Standard Changes, CS-SC005b Page 13:**

The summary of changes to CS-SC005b refers to “uncertified GPS positions”. Elsewhere in the document the generic term “GNSS” is used instead. Suggest changing “uncertified GPS positions” to “uncertified GNSS positions”.

response Accepted

The proposed text has been inserted in the Standard Change.

Thank you

comment 82 comment by: *DGAC France*

Page 16 about CS-SC108a — EXCHANGE OF HANDHELD FIRE EXTINGUISHERS FOR HALON-FREE TYPES (new):  
Note that regulation 744/2010 will impose halon-free fire extinguishers for all aircraft starting Jan-1st, 2025.

response Noted

comment 132 comment by: *Spanish Aviation Safety and Security Agency (AESA)*

Typing error in page 16: Instead of CS-SC0105ba, it should be CS-SC105b.

response Accepted

comment 175 comment by: *EUROCONTROL*

2.3 overview "CS-SC STAN.80"

Level Medium

The change overview refers to introduction of definitions for ‘transponder-based 1090 MHz extended squitter ADS-B transmitters’ and ‘1090 MHz non-transponder devices (NTDs)’ but the definitions are not visible in CS STAN.80.

Include definitions

response Accepted

The definitions from Section 2.3 of the NPA have been reintroduced.

Thank you



**CS STAN.07 Identification of technical/non-technical revisions**

p. 20

comment	8	comment by: <i>Samionics / General Aviation Avionics</i>
	Please dont complicate things to much, uppercase, lowercase and numbers. Keep revision designations as before, there is no need to differentiate technical and editorial revisions.	
response	Accepted	
	In order to simplify revisions to CS-STAN, it is agreed to use the original revision indication only and remove the potential split between technical and non-technical changes. CS STAN.07 has been deleted, as well as any indication of a non-technical change. Those changes will be reflected as normal revisions, like the rest.	

**CS STAN.00 Scope**

p. 20

comment	133	comment by: <i>Spanish Aviation Safety and Security Agency (AESA)</i>
	In CS STAN.00 Scope, there is not any general limitation related to the aircraft type of operation (i.e. there is not an explicit limitation for aircraft used by air carriers in accordance with Regulation nº 1008/2008). But in the first page, it is said that the affected stakeholders are "Air operators other than airlines". This can be confusing.	
	It would be useful to <b>clarify if there is any general limitation regarding the operation of the aircraft</b> (apart from the specific limitations stated in each SC / SR).	
response	Not accepted	
	The statement 'Air operators other than airlines' on the cover page of NPA 2021-06 is provided to highlight the stakeholders that are primarily expected to be affected by the proposed changes.	
	CS-STAN.00 already explains how the scope of the technical specifications of standard changes is set in Part 21, while its use is regulated by Part-M and Part-ML.	

**3.1. Draft certification specifications (draft EASA decision)**

p. 20

comment	307	comment by: <i>Airbus Helicopters</i>						
	<table border="1"> <tr> <td>Page No:</td> <td>20</td> </tr> <tr> <td>Paragraph No:</td> <td>second paragraph</td> </tr> <tr> <td>Comment:</td> <td>An editorial correction is proposed below to achieve issue alignment to overall CNS integrated airborne solutions EASA wording proposal:</td> </tr> </table>		Page No:	20	Paragraph No:	second paragraph	Comment:	An editorial correction is proposed below to achieve issue alignment to overall CNS integrated airborne solutions EASA wording proposal:
Page No:	20							
Paragraph No:	second paragraph							
Comment:	An editorial correction is proposed below to achieve issue alignment to overall CNS integrated airborne solutions EASA wording proposal:							



	“In particular, CS-STAN cannot be used to install or exchange integrated avionics or navigation systems, unless explicitly allowed.”
Rationale:	Completeness and editorial
Proposed text:	In particular, CS-STAN cannot be used to install or exchange integrated avionics or <b>communication</b> , navigation or <b>surveillance</b> systems, unless explicitly allowed
response	<p>Accepted</p> <p>Thank you for spotting this editorial correction, which is indeed also inconsistent with CS-SC006a.</p>

**CS STAN.45 Flammability protection**

p. 21

comment	<p>83 <span style="float: right;">comment by: <i>DGAC France</i></span></p> <p>It would be added-value that EASA defines the applicable aeronautical standards or military standards for flammability protection (ASTM guidance?)</p>
response	<p>Noted</p> <p>EASA has reconsidered the suitability of a generic paragraph addressing design considerations for flammability in CS STAN.45 and has decided not to introduce CS STAN.45 into CS-STAN Issue 4.</p> <p>CS-STAN, in principle, is intended to provide the outcome of design considerations within the specific standard change or standard repair. This is included in such a way that this information is sufficiently detailed for the level of competence of the person responsible for the embodiment of the standard change or standard repair. If needed, specific provisions addressing flammability issues would, therefore, be included in the specific standard change or standard repair, as applicable.</p>

comment	<p>124 <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span></p> <p>Flammability protection is a very important issue in aircraft, as inflight fires often have a catastrophic outcome. However, not only the aviation industry or military facilities have developed standards to determine and classify flammability resistance.</p> <p>We suggest that in addition to aeronautical and military standards, sufficient industry standards as ISO, DIN, EN, VDE should be acceptable for the compliance demonstration. The equipment / material manufacturer could state the appropriate standard on a document such as a manual or datasheet, or in written communication, e.g. an email.</p>
response	<p>Noted</p>



EASA has reconsidered the suitability of a generic paragraph addressing design considerations for flammability in CS STAN.45 and has decided not to introduce CS STAN.45 in CS-STAN Issue 4.

CS-STAN, in principle, is intended to provide the outcome of design considerations within the specific standard change or standard repair. This is included in such a way that this information is sufficiently detailed for the level of competence of the person responsible for the embodiment of the standard change or standard repair. If needed, specific provisions addressing flammability issues would, therefore, be included in the specific standard change or standard repair, as applicable.

comment 147 comment by: Europe Air Sports

NPA text:  
 "If the electronic part of the electronic conspicuity function or a device is installed in a location not readily visible to the occupants, then it shall meet the criteria of a 'small part' from a flammability perspective, or it shall be included in a metal case. "

Comment:  
 Inconsistency: It is unclear why this requirement only applies to electronic conspicuity (EC) devices and not other electronics. Furthermore we do not regard EC devices as having particularly high power consumption i.e. they are not particularly susceptible to overheating or fire.

response Noted

EASA has reconsidered the suitability of a generic paragraph addressing design considerations for flammability in CS STAN.45 and has decided not to introduce CS STAN.45 in CS-STAN Issue 4.

CS-STAN, in principle, is intended to provide the outcome of design considerations within the specific standard change or standard repair. This is included in such a way that this information is sufficiently detailed for the level of competence of the person responsible for the embodiment of the standard change or standard repair. If needed, specific provisions addressing flammability issues would, therefore, be included in the specific standard change or standard repair, as applicable.

comment 176 comment by: EUROCONTROL

CS STAN.45 Flammability protection

Editorial

The section is general on flammability protection and suddenly in second major bullet the text is focused/limited to "If the electronic part of the electronic conspicuity function or a device is installed.."

Make the text generic "If an electronic part or a device is installed.."

response Not accepted



EASA has reconsidered the suitability of a generic paragraph addressing design considerations for flammability in CS STAN.45 and has decided not to introduce CS STAN.45 in CS-STAN Issue 4.

comment

223

comment by: FOCA Switzerland

— *“They are OEM items; this implies that these articles are included into the parts catalogue of the aircraft and that their intended usage is similar in form/fit/function/weight as their original usage on that aircraft; “*

From our perspective this should also contain “similar location (Cabin, Wing, Engine compartment)” to ensure the component fulfills the requirements from this area.

— *“They hold a positive qualification test from an independent test laboratory. Additionally, the equipment supplier using such items declares that the test results for these items ensure an appropriate level of protection for flammability for installation on an aircraft eligible to be modified in accordance with CS-STAN; “*

There are many standards available – some of them are probably not suitable for aviation. We therefore propose to specify: *“a positive qualification against aviation standards”*. This could limit this to known standards in aviation industries.

Regarding “Small parts” we propose to consider also to accept the parts in accordance to DO-160, Section 26.

response

Not accepted

EASA has reconsidered the suitability of a generic paragraph addressing design considerations for flammability in CS STAN.45 and has decided not to introduce CS STAN.45 in CS-STAN Issue 4.

Specific provisions addressing flammability issues are now included in the standard change or standard repair, as applicable.

comment

231

comment by: DGAC France

CS STAN.45 is a new requirement regarding flammability protection. Flammability protection was already taken into account through two SCs about seat cushions (CS-SC152) and material covering floor/sidewall/ceiling (CS-SC103).

This new generic CS STAN.45 introduces additional requirement regarding any mechanical items, electrical items, CBs, coaxial cables and wires (which should already be "acceptable" according to the acceptable methods, techniques and practices of each SC) and regarding electronic part of the EC function or device not readily visible to the occupants.

Considering the scope of the CS-STAN which is to reduce the administrative burden for the embodiment of **simple** changes and **simple** repairs in GA, we would like to know the rationale introducing this new CS STAN.45 requirement if we already consider the new CS STAN.47 about internal lithium batteries.



Moreover, it is not clear why such a verification is introduced for E-conspicuity devices but not for FLARM devices ?

response Noted

EASA has reconsidered the suitability of a generic paragraph addressing design considerations for flammability in CS STAN.45 and has decided not to introduce CS STAN.45 in CS-STAN Issue 4.

CS-STAN, in principle, is intended to provide the outcome of design considerations within the specific standard change or standard repair. This is included in such a way that this information is sufficiently detailed for the level of competence of the person responsible for the embodiment of the standard change or standard repair. If needed, specific provisions addressing flammability issues would, therefore, be included in the specific standard change or standard repair, as applicable.

comment 288 comment by: *European Sailplane Manufacturers*

In any modern cockpit of a sailplane we have already a vast number of electronic parts which are not visible to the occupants.  
The risk of a fire or smoke generated by such parts might exist, but service experience shows that this (if at all) only a very small danger.

Introduction of either fulfilling the criteria of a "small part" or requiring a metal case is therefore onerous.

If this paragraph should be read for sailplanes that "no flammability protection is required for sailplanes, therefore disregard CS STAN.45" tzhen this should be clearly indicated and not only implied.

But even then we doubt that it would be wise to require this as this could prevent very useful safety devices to become excluded from installation (e.g. a Flarm device, which would be larger than "small" and which has no metal case) in aircraft where flammability protection is required.

response Accepted

EASA has reconsidered the suitability of a generic paragraph addressing design considerations for flammability in CS STAN.45 and has decided not to introduce CS STAN.45 in CS-STAN Issue 4.

CS-STAN, in principle, is intended to provide the outcome of design considerations within the specific standard change or standard repair. This is included in such a way that this information is sufficiently detailed for the level of competence of the person responsible for the embodiment of the standard change or standard repair. If needed, specific provisions addressing flammability issues would, therefore, be included in the specific standard change or standard repair, as applicable.

**CS STAN.42 Environmental conditions**

p. 21

comment 123 comment by: *Malte HOELTKEN*





Some equipment eligible for installation into an aircraft via Standard Changes are not produced by aircraft manufacturers, e.g. LED lights, DC-DC-converters, flexible seals, CO-warners and such. These manufacturers will not necessarily be knowledgeable enough about aircraft to issue a statement or declaration for the suitability of their products for installation on the aircraft type or operations defined within the SC.

We suggest to add the option that the person responsible for the embodiment of a standard change could compare the (generic) environmental conditions of the equipment to the expected conditions during operations of the aircraft. This comparison could be noted directly onto Form 123 or as an addendum to it, to keep it as unbureaucratic as the manufacturers email mentioned.

We suggest to add to CS STAN.42:

- Alternatively, the person responsible for the embodiment of the SC could compare environmental limitations of the equipment manufacturer to the expected operational environmental conditions. This comparison could be noted as an addendum to Form 123 or in a written communication (e.g. email).

response

Accepted

For non-aviation-specific equipment and parts, the person responsible for the embodiment of the standard change should state and record that it is considered suitable for the anticipated environmental conditions in which the part is used. This option is added in CS STAN.42.

comment

308

comment by: Airbus Helicopters

Paragraph No:	CS STAN.42 Environmental Conditions
Comment:	EASA wording proposal: “Ensure that the equipment manufacturer has declared that the equipment is suitable for installation on the aircraft type and for the operations defined in the standard change (SC)” Equipment manufacturer responsibilities for equipment installation are not addressed within EASA Part 21.
Rationale:	Equipment manufacturer responsibilities for equipment installation are not addressed within EASA Part 21.
Proposed text:	Ensure that the equipment manufacturer has declared that the equipment is suitable for <b>aviation use during normal operational phases</b> <del>installation on the aircraft type</del> and for the operations defined in the standard change (SC)”

response

Not accepted

The equipment manufacturer is in most cases responsible for both design and production. Part 21 does specify the suitability of a design for its intended environmental conditions, and that information is for instance also required to be



provided to the installer in an EASA Form 1, when issued by a manufacturer under a POA (see also completion instructions block 12).

**CS STAN.48 Installation check flights**

p. 22

comment	<p><b>115</b> <span style="float: right;">comment by: <i>DGAC France</i></span></p> <p>The pilot conducting the « installation check flight » must receive an appropriate briefing. From whom ? Who is responsible to brief the pilot ? He must also make sure that, if appropriate, ground/functionnal tests have been performed and are satisfactorily.</p> <p>Any GM to conduct the risk assessment ? This exercice is not an easy one and guide should be provided to help the pilot to do it.</p> <p>The pilot must also make sure that, if appropriate, he is provided with AFMS and he must be aware of the limitations/conditions contained in it.</p>
response	<p>Not accepted</p> <p>Changes and repairs in CS-STAN are of a low-risk nature, otherwise they would not be suitable for inclusion in CS-STAN. The responsibility lies with the pilot that conducts the installation check flight to familiarise themselves with the change and potential consequences, and what needs to be checked.</p>
comment	<p><b>126</b> <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span></p> <p>The wording of CS STAN.48 might imply a necessity of a written brifing, risk assessment, procedure and checklist. This would lead to an unnessecary bureaucratic hurdle for performing easy piloting tasks without any elevated risks, as posed for example by the flight testing of an exchanged antenna.</p> <p>We do agree that a pilot performing an installation test flight should be obliged to perform these assessments, but depending on the complexity of the given task an oral briefing and a mental assessment should suffice to perform these tasks safely and effectively. Hence we suggest to add the sentence:</p> <p><i>Depending on the complexity of the installation test flight tasks and the complexity of the standard change, the pilot may chose to perform risk assessment and establish risk mitigation procedures, test procedures and checklists in written or unwritten manner.</i></p>
response	<p>Partially accepted</p> <p>It is agreed that not all installation check flights require a documented ‘installation check flight plan’.</p>



CS STAN.48 is amended to add this possibility by stating the following:

‘Depending on the complexity of the installation test flight tasks and the complexity of the standard change, the pilot may choose not to require a documented risk assessment, risk mitigation procedures, test procedures and checklists. This should be recorded in block 6 of the EASA Form 123.’

comment

134

comment by: *Spanish Aviation Safety and Security Agency (AESA)*

In new point CS STAN.48, installation check flights, one of the conditions to be met is that the pilot conducting the check flight must conduct a risk assessment. There is not any information about the minimum requirements of this risk assessment.

We propose to **include some information about the risk assessment minimum requirements**. It could be included as a definition in CS STAN.48

response

Not accepted

Changes and repairs in CS-STAN are of a low-risk nature, otherwise they would not be suitable for inclusion in CS-STAN. The responsibility lies with the pilot that conducts the installation check flight to familiarise themselves with the change and potential consequences, and what needs to be checked.

comment

135

comment by: *Spanish Aviation Safety and Security Agency (AESA)*

In new point CS STAN 48, installation check flights, it is not stated the necessity of keeping the records of the flight test and the risk assessment performed.

We propose to **include the obligation of keeping the records of the flight test and the risk assessment performed**.

response

Not accepted

Consistent with comment #115.

Changes and repairs in CS-STAN are of a low-risk nature, otherwise they would not be suitable for inclusion in CS-STAN. The responsibility lies with the pilot that conducts the installation check flight to familiarise themselves with the change and potential consequences, and what needs to be checked.

comment

136

comment by: *Spanish Aviation Safety and Security Agency (AESA)*

In the previous existing note in CS-SC051 (point 3), related to flight checks, it was clarified that a Permit to fly was not necessary because the fly was part of the CS installation activity. This information has not been moved to the new point CS STAN.48 and it is proposed to be deleted.

We propose to maintain this information related to Permits to fly and move it to the new point CS STAN.48.

response

Partially accepted



The information is transposed as general information into CS STAN.48.  
 Consistently with this change, also CS-SC210 is amended. The information concerning installation check flights is replaced by a reference to CS-STAN.48.

comment	<p>309</p> <p style="text-align: right;">comment by: <i>Airbus Helicopters</i></p> <table border="1"> <tr> <td>Paragraph No:</td> <td>CS STAN.48 Installation check flights</td> </tr> <tr> <td>Comment:</td> <td>Installation check flight activities may be extended with operational checks performed during installation ground tests.</td> </tr> <tr> <td>Rationale:</td> <td>Function properly when installed can be demonstrated with flight and ground test activities.</td> </tr> <tr> <td>Proposed text:</td> <td>                     Within the scope of CS-STAN, every time an <b>installation operational check</b> is listed among the activities to be performed in order to embody an SC or an SR in the aircraft, the pilot conducting the ‘installation check flight / <b>operational check</b>’ must:                     <ul style="list-style-type: none"> <li>— make sure that the ratings and flight experience are suitable for the technical content of the flight;</li> <li>— receive an appropriate briefing; this briefing shall include:                             <ul style="list-style-type: none"> <li>— a description of the standard change to be implemented and the related system or equipment identified as potentially unreliable, and</li> <li>— the scope and the objective of the installation check flight / <b>operational check</b>;</li> </ul> </li> </ul> </td> </tr> </table>	Paragraph No:	CS STAN.48 Installation check flights	Comment:	Installation check flight activities may be extended with operational checks performed during installation ground tests.	Rationale:	Function properly when installed can be demonstrated with flight and ground test activities.	Proposed text:	Within the scope of CS-STAN, every time an <b>installation operational check</b> is listed among the activities to be performed in order to embody an SC or an SR in the aircraft, the pilot conducting the ‘installation check flight / <b>operational check</b> ’ must: <ul style="list-style-type: none"> <li>— make sure that the ratings and flight experience are suitable for the technical content of the flight;</li> <li>— receive an appropriate briefing; this briefing shall include:                             <ul style="list-style-type: none"> <li>— a description of the standard change to be implemented and the related system or equipment identified as potentially unreliable, and</li> <li>— the scope and the objective of the installation check flight / <b>operational check</b>;</li> </ul> </li> </ul>
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response	<p>Not accepted</p> <p>CS-STAN.48 is specifically drafted to capture the issues that are related with the mitigation of potential risks in an installation check flight. Operational checks on the ground are not within that scope.</p>								

<b>CS STAN.47 Internal lithium batteries</b>	p. 22
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comment	<p>148</p> <p style="text-align: right;">comment by: <i>Europe Air Sports</i></p> <p>See comment to CS-SC034c. CS-STAN 47 operates with an even lower limit of 100 Wh. The same comment applies, and we are unsure as to whether the lack of consistency between CS-SC034c and CS-STAN 47 can be justified.</p>
response	<p>Not accepted</p> <p>The limit is lower as CS STAN.47 poses a higher risk than CS-SC034c does due to the following:</p> <ul style="list-style-type: none"> <li>- Chemistry is not limited to LiFePO4 (safer than other chemistries).</li> </ul>



- It is not limited to the exchange of existing batteries, so it can be batteries installed in new locations not previously assessed.

Please, see also the response to comment #151 as regards CS-SC034c.

comment 289 comment by: *European Sailplane Manufacturers*

The proposed method to assess whether a Lithium battery is acceptable by looking at the energy content (the maximum 100 Wh) is not really helpful.

Experience shows that the risk of fire / smoke / thermal runaway is quite different for different Lithium battery systems.

Especially the already well established LiFePO4 batteries seem here to be rather low-risk.

Otherwise if non-protected Lithium batteries might be taken from the typical radio-controlled model aircraft suppliers then certain and additional care might be really required.

To address this we would propose to at least differentiate the energy limitation for different Lithium battery systems.

response Not accepted

It is acknowledged that LiFePO4 batteries are intrinsically safer than other chemistries; however, they can still suffer a thermal runaway posing a risk to the aircraft as other chemistries do, so the limit is established for all chemistries as the effect of thermal runaway is mainly dependent on the energy content.

Therefore, qualification is also requested regardless of the lithium chemistry (conditions from Standard Change SC034Cc) as it is requested during the certification of lithium batteries, where the chemistry is not differentiated.

### CS STAN.80 Definitions and abbreviations

p. 23

comment 3 comment by: *Aviation Division*

Regulation (EU) No 1321/2014 Article 3 (7) The continuing airworthiness of aeroplanes with a maximum certificated take-off mass at or below 5 700 kg which are equipped with multiple turboprop engines shall be ensured in accordance with the requirements applicable to other than complex motor-powered aircraft as set out in points M.A.201, M.A.301, M.A.302, M.A.601 and M.A.803 of Annex I (Part-M), point 145.A.30 of Annex II (Part-145), points 66.A.5, 66.A.30, 66.A.70, Appendix V and VI of Annex III (Part-66), point CAMO.A.315 of Annex Vc (Part-CAMO), point CAO.A.010 and Appendix I of Annex Vd (Part-CAO) to the extent that they apply to other than complex motor-powered aircraft. This statement has not been taken into account in CS.STAN.80.

response Not accepted

The definition of 'complex motor-powered aircraft' (CMPA) has been transposed from Regulation (EC) No 216/2008 into Article 140 of Regulation (EU) 2018/1139. For



CS-STAN Issue 4, the Agency has not proposed changes to this definition. In CS-STAN, the term 'CMPA' is used in the applicability of certain standard changes. The extension of the applicability of such standard changes to aeroplanes with multiple-turboprops was not intended nor proposed by stakeholders for EASA's consideration. Therefore, the definition provided does not include multi-prop aeroplanes, despite Article 3(7) of Regulation (EU) No 1321/2014.

comment

116

comment by: *DGAC France*

« Primary structure » definition : It should be added to the definition « structure whose failure would reduce the structural integrity of the airframe or prevent the aircraft from continuing safe flight and landing ».

response

Not accepted

The definition is as per AMC 20-29, Primary Structure: 'The structure which carries flight, ground, or pressurisation loads, and whose failure would reduce the structural integrity of the aircraft.'

Since this definition is broadly used, it is not specifically added in CS-STAN.

comment

125

comment by: *Malte HOELTKEN*

We suggest to move any definition and abbreviation not originating within CS STAN into a GM CS STAN.80. In addition, we suggest to mention the source of intentional initial definition of a term within the EASA System (e.g. for "complex motorpowered aircraft"). This eliminates the possibility of two regulations accidentally stating two diverging definitions for an identical term.

response

Not accepted

As identified, definitions used in several documents should not be duplicated to eliminate the possibility of diverging definitions. The challenge remains that definitions exist at various levels of regulations, rules, CSs, etc., which are not interchangeable levels.

comment

137

comment by: *Spanish Aviation Safety and Security Agency (AESA)*

We agree with the inclusion of the definition of "Complex motor-powered aircraft" (CMPA) but it would be useful to include some information about the future criteria / definition to be used instead of CMPA.

response

Not accepted

This definition will be reviewed at a later stage, not just for CS-STAN.

comment

11

comment by: *Samionics / General Aviation Avionics*

	Perhaps add a reference to:  CS-23 Amdt 4 23.1529 Instructions for Continued Airworthiness (With Appendix G)  CS VLA Amdt 1 VLA.1529 Instructions for Continued Airworthiness  Other references? That explains the intent and content of ICA in more detail.
response	Not accepted  Reference is made to the existing ICAs for aircraft, and it is not the intention to refer the installer to the certification requirements of the suggested CSs. In addition, a new GM (i.e. GM CS STAN.50) has been introduced to provide more guidance on the expected contents of the ICAs (including a template).

comment	174 <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span>  ICA is usually an abbreviation for "Instructions for continuing airworthiness", as defined and used in Regulation (EU) No 1321/2014 and its Appendices. We suggest to adhere to this abbreviation and not change it to "Instructions for continued airworthiness" within this regulation for consistency purposes.
response	Accepted  Corrected consistently with the title of CS STAN.50.

**Standard Change CS-SC001 a b**

p. 28

comment	24 <span style="float: right;">comment by: <i>KSAK - Swedish Royal Aero Club</i></span>  Changes are fair and acknowledged.
response	Noted

comment	169 <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span>  We agree, that a test flight is perfectly suitable to test transmission and reception of a new radio installation. However, we also think that the evaluation of output power based on wattage or other suitable assessment analysis methods should be allowed in cases the test flight cannot be conducted before release to service. Accepting both evaluation methods would provide the person responsible for the embodiment of the change with more flexibility.
response	Partially accepted  The objective was to simplify installation while ensuring proper functioning.  EASA has added the possibility to use the manufacturer's instructions.



comment	234	comment by: <i>FNAM</i>
	<p><b>Position:</b> Addition of a note of precision on the speeds: Favorable opinion. Addition of the recommendation to use RG400 antenna cables: Favorable opinion.</p> <p><b>Question:</b> In general, for CS-STANs, must a mechanic have a specific license for the maintenance task that he will make?</p> <p>Why this CS STAN is limited to VFR aircraft? In fact, for VFR or IFR aircraft, the equipment is the same and the installation and test procedures as well.</p>	
response	<p>Noted</p> <p>The requirements with regard to mechanical qualifications are listed in each standard change in paragraph 6 'Release to service'.</p> <p>EASA would need proposals for mitigation means that would support the risk–benefit analysis for IFR-certified aircraft.</p>	

## Standard Change CS-SC002d

p. 30

comment	25	comment by: <i>KSAK - Swedish Royal Aero Club</i>
	<p>We prefer the word suitable instead of qualified. And it makes no sense to change the wording from suitable to qualified when you have done the opposite for the VHF.</p>	
response	<p>Accepted</p> <p>Thank you. The wording has been changed in all Standard Changes.</p>	
comment	41	comment by: <i>CAA CZ</i>
	<p>1) 1) Latest amendment of Regulation (EU) No 1207/2011 is (EU) No 2020/587 (a reference to this amendment (EU) No 2020/587 needs to be added in this SC). 2) Installation requirements are in para. CS ACNS.D.ELS.050 and following (not all of them are applicable to aircraft applicable in this SC).</p>	
response	<p>Accepted</p> <p>For part 1 of comment #41, please see the response to comment #186. For part 2 of comment #41, please see the response to comment #310.</p>	
comment	127	comment by: <i>Malte HOELTKEN</i>
	<p>The mandate to establish maintenance intervals as required by the equipment manufacturer contradicts the possibility to organise maintenance on the aircraft with an applicable minimum inspection programme as defined in ML.A.302, or precisely as outlined in AMC1 ML.A.302(d).</p>	





response	<p>We suggest to streamline item 5 of this SC as has been done on CS-SC001:</p> <p><i>Amend the Instructions for Continued Continuing Airworthiness (ICAs) to establish maintenance actions/inspections and intervals, as required.</i></p> <p>Accepted</p> <p>The proposed text, making this consistent with SC001, has been inserted.</p>
comment	<p>186 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC002d</p> <p>Level Medium</p> <p>The applicability text use non-precise language "provided that they do not have to comply with the ADS-B mandate (see Regulation (EU) No 1207/2011 as amended by Regulation (EU) No 1028/2014) and with Regulation (EU) 2017/386)". The text should refer to the regulation name instead of "the ADS-B mandate". Restricting only the ADS-B part of the SPI can be clarified by referring to the "ADS-B parts of the SPI".</p> <p>Further, as currently written it is unclear if SC002 is acceptable to comply with (a means of compliance to) the SPI for the ELS part. It should be clarified SC002 is acceptable for this part.</p> <p>The text should also reflect that the regulation has been amended a third time by regulation 2020/587</p> <p>Update and clarify as per comment</p>
response	<p>Accepted</p> <p>'ADS-B mandate' has been replaced by 'ADS-B parts' of the SPI Regulation.</p> <p>Reference to ELS has been added.</p> <p>The reference to the SPI Regulation has been changed to the initial Regulation and all its amendments in a generic manner. A note has been added for the currently applicable amendments.</p>
comment	<p>235 <span style="float: right;">comment by: FNAM</span></p> <p><b>Position:</b> No comments: Neutral opinion.</p> <p>The addition of the ASTM F2639-18 reference is relevant, however organizations should not be required to have this version because it is not free, unlike the FAA document: Favorable opinion.</p>
response	<p>Noted</p> <p>The use of the referenced ASTM standard is not mandatory, but only an option.</p>

No change is needed.

comment

310

comment by: Airbus Helicopters

Paragraph No:	Standard Change CS-SC002d INSTALLATION OF MODE S ELEMENTARY SURVEILLANCE EQUIPMENT / subparagraph 3 Acceptable methods, techniques and practices
Comment:	EASA wording proposal: -The transponder equipment and its installation meet point CS ACNS.D.ELS.010 [...] -The elementary surveillance system provides data according to CS ACNS.D.ELS.015. address also transponder installation features that are not relevant for non-complex motor powered aircraft.
Rationale:	Imposing compliance investigation for systems not installed in non-complex rotorcraft e.g. ACAS II, is beyond the scope of CS STAN
Proposed text:	-The transponder equipment and its installation meet point CS ACNS.D.ELS.010 <b>characteristics relevant for non-complex motor powered aircraft</b> [...] -The elementary surveillance system provides <b>relevant</b> data according to CS ACNS.D.ELS.015.

response

Accepted

Thank you. The proposed text has been inserted.

**Standard Change CS-SC003b**

p. 32

comment

236

comment by: F NAM

**Position:** No comments: Neutral opinion.

response

Noted

**Standard Change CS-SC004b**

p. 34

comment

12

comment by: Samionics / General Aviation Avionics

"An EASA Form 1 is needed for the installation if the antenna receives/transmit signals from/to equipment that is also installed with an EASA Form 1."

What about Part 21.A.307(c)?



	<p>"The antenna is located in at a distance to from other antennas that is appropriate for the aircraft and the antennas."</p> <p>This may be difficult since the associated installation manuals do not always take into account all scenarios. One important thing to consider is the distance between a COM antenna and a ELT antenna (121.5MHz). 2.5 meters, see also EASA certification memoranda EASA CM-AS-008.</p> <p>Below a copy paste from the certification memoranda.</p> <p>"Ideally, for the 121.5 MHz ELT antenna, 2.5 meters is a sufficient separation from VHF communications and navigation receiving antennas to minimize unwanted interference. The 406 MHz ELT antenna should be positioned at least 0.8 meter from VHF communications and navigation receiving antennas to minimize interference."</p> <p>There may also be a need to update CS-SC101b accordingly.</p>
response	<p>Partially accepted</p> <p>An EASA Form 1 is needed to assure that fully compatible antennas and equipment are integrated.</p> <p>The proposal regarding the spacing has been accepted.</p> <p>CS-SC101b excludes the installation of antennas.</p> <p>Thank you</p>
comment	<p>27 <span style="float: right;">comment by: <i>KSAK - Swedish Royal Aero Club</i></span></p> <p>You mention that form one is required. You should also add the provision for owner parts from Part-21. But maybe that is also implied any time form one is mentioned?</p>
response	<p>Partially accepted</p> <p>A Form 1 is required for antennas when they are connected to a unit that also requires a Form 1.</p> <p>The text has been changed according to the text proposed in comment #128.</p>
comment	<p>53 <span style="float: right;">comment by: <i>Garmin International</i></span></p> <p><b>CS-SC004b Page 34:</b></p> <p>In section 3, the sentence "The equipment is qualified suitable for the environmental conditions". The word "qualified" should be deleted to be consistent with similar statements in other SCs.</p>
response	<p>Accepted</p> <p>Corrected</p>
comment	<p>84 <span style="float: right;">comment by: <i>DGAC France</i></span></p>



	1 Purpose : EASA to clarify what is implied by RADAR antenna (it is understood that CS-SC004 does not apply to antenna installations falling under CS-SC005). Does it mean transponder antennas fall under the RADAR antenna category?
response	Partially accepted  The revision of this Standard Change does not intend to change the type of antenna that can be installed with this Standard Change. A transponder is a transceiver.  A note has been added.

comment	128 <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span>  Item 3 mandates a Form 1 for the antenna for equipment installed with a Form 1. This removes the possibility to exchange antennae for equipment that has been installed with Form 1 in times when the possibility of installation without form 1 has not been established. Hence, we suggest to allow the installation of antennae without a Form 1, when the new installation of such equipment under this regulation does not mandate a Form 1. This would be in alignment with the objectives and rationale outlined in chapter 2.3:  <i>An EASA Form 1 is needed for the installation if the antenna receives/transmit signals from/to equipment that can only be installed with an EASA Form 1.</i>
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response	Accepted  The proposed text has been accepted.  Thank you
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comment	237 <span style="float: right;">comment by: <i>FNAM</i></span>  <b>Position:</b> No comments: Favorable. <b>Question:</b> Is it possible that an alternative with a bench test is carried out? If so, is it possible to add this possibility?
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response	Noted  A flight check is the easiest way to confirm proper functioning. The flight check is not a test flight.  EASA welcomes detailed alternative solutions.
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comment	311 <span style="float: right;">comment by: <i>Airbus Helicopters</i></span>						
	<table border="1"> <tr> <td>Paragraph No:</td> <td>Standard Change CS-SC004b INSTALLATION OF ANTENNAS / subparagraph 3 Acceptable methods, techniques and practices</td> </tr> <tr> <td>Comment:</td> <td>EASA wording proposal “The installed systems include the required and non-required systems” is ambiguous</td> </tr> <tr> <td>Rationale:</td> <td>Required / non required attributes are expected to be defined with reference to airworthiness rules, air operations rules or a combination thereof</td> </tr> </table>	Paragraph No:	Standard Change CS-SC004b INSTALLATION OF ANTENNAS / subparagraph 3 Acceptable methods, techniques and practices	Comment:	EASA wording proposal “The installed systems include the required and non-required systems” is ambiguous	Rationale:	Required / non required attributes are expected to be defined with reference to airworthiness rules, air operations rules or a combination thereof
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Comment:	EASA wording proposal “The installed systems include the required and non-required systems” is ambiguous						
Rationale:	Required / non required attributes are expected to be defined with reference to airworthiness rules, air operations rules or a combination thereof						



	<p>Proposed text: The installed systems include the required and non-required systems, as defined in EASA basic regulation e.g. required for the assessment of the type design, or by operating rules</p>
response	<p>Accepted</p> <p>The proposed text has been accepted.</p> <p>Thank you</p>

<b>Standard Change CS-SC005b</b>	p. 36
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comment	42		comment by: CAA CZ
		<p>1) 1) Latest amendment of Regulation (EU) No 1207/2011 is (EU) No 2020/587 (a reference of Applicability needs to be updated in this SC).</p> <p>2) From the SC description in chapter “Purpose” it is not clear, whether the SC covers also installation of a GNSS system used as a position source to the ADS-B system, or if a ADS-B transponder with integrated position source may be installed using this SC, or whether the SC can only be used utilizing an pre-existing position source (GNSS) and hence does not cover the GNSS system installation (the GNSS may be installed by use of CS-SC052d).</p>	
response		<p>Accepted</p> <p>1) Corrected. See also the replies to comments #186 and #187.</p> <p>2) Installation includes a new installation or the exchange of a unit. The Standard Change refers to the transponder that includes ADS-B OUT. The GNSS receiver can pre-exist.</p> <p>This SC provides information regarding the configuration of the quality parameters. Please, see also the reply to comment #60.</p>	

comment	54		comment by: Garmin International
		<p><b>CS-SC005b Page 36:</b></p> <p>Section 1 refers to “GPS position and velocity”. Elsewhere in the document the generic term “GNSS” is used instead. Suggest changing to “GNSS position and velocity”.</p>	
response		<p>Accepted</p> <p>The proposed text has been accepted.</p> <p>Thank you</p>	

comment	55		comment by: Garmin International
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response	<p><b>CS-SC005b Page 36:</b></p> <p>Section 1 contains the sentence “Equipment emitting with quality indicators that are set to zero (0) might not be seen by other aircraft systems or by ATC”. In such an installation, the transponder function would continue to ensure that the aircraft is seen by TAS/TCAS and ATC. We suggest revising the sentence to “ADS-B information sent from equipment emitting quality indicators that are set to zero (0) may not be seen by other aircraft systems or by ATC”.</p> <p>Accepted</p> <p>The proposed text has been accepted.</p> <p>Thank you</p>
comment	<p>56 <span style="float: right;">comment by: <i>Garmin International</i></span></p> <p><b>CS-SC005b Page 37:</b></p> <p>The fifth condition for Configuration 1 includes “compatibility of the combination of the transponder and the GNSS receiver for conformity to AMC 20-24”.</p> <p>We suggest expanding to accept conformity to CS ACNS.D.ADSB as well as AMC 20-24. We recognize that CS ACNS.D.ADSB meets AMC 20-24, but feel the SC should clearly state acceptability of conformity to CS ACNS.D.ADSB.</p>
response	<p>Accepted</p> <p>This expansion was implied. Text has been added to make it explicit.</p> <p>Thank you</p>
comment	<p>57 <span style="float: right;">comment by: <i>Garmin International</i></span></p> <p><b>CS-SC005b Page 38:</b></p> <p>For Configuration 2, fourth condition, first sub-condition, the quality indicators for ADS-B transmit equipment approved in accordance to ETSO-C166a or later are stated to be “typically with SDA <math>\geq</math> 1 and SIL = 1”.</p> <p>Because both position source and transponder are approved, we suggest this be changed to “typically with SDA = 1 and SIL = 1” as stated by ETSO-C199.</p>
response	<p>Accepted</p> <p>The text has been revised accordingly.</p> <p>Thank you</p>
comment	<p>58 <span style="float: right;">comment by: <i>Garmin International</i></span></p> <p><b>CS-SC005b Page 39:</b></p>

response	<p>The second condition for Configuration 3 states “Nevertheless, the installer follows the instructions from the manufacturer of the transponder to connect the GPS source”. The use of the term “GPS source” is inconsistent with other references in the section that use “GNSS receiver”.</p> <p>Suggest changing to “GNSS source” for consistency.</p> <p>Accepted</p> <p>The text has been amended accordingly.</p> <p>Thank you</p>
comment	<p>74 <span style="float: right;">comment by: TCCA , National Aircraft Certification</span></p> <p>SC005b, Section 1 Purpose.</p> <p>The description for Configuration 2 indicates that it covers “an ADS-B OUT equipment” with “ETSO-C199() GNSS Position Source”.</p> <p>Considering that configuration 2 is mainly focusing on Class B equipment, not Class A equipment, as defined in ETSO-C199(), suggest to add:  “Configuration 2: an ADS-B OUT system with a GNSS position source that is approved in accordance with Class B ETSO-C199 equipment”</p> <p><u>Replace:</u>  “Configuration 2: an ADS-B OUT system with ETSO-C199() GNSS Position Source. “</p> <p><u>With:</u>  “Configuration 2: an ADS-B OUT system with a GNSS position source that is approved in accordance with Class B ETSO-C199 equipment”</p>
response	<p>Accepted</p> <p>The proposed text has been accepted.</p> <p>‘approved’ has been replaced by ‘authorised’, as per comment #312.</p> <p>Thank you</p>
comment	<p>75 <span style="float: right;">comment by: TCCA , National Aircraft Certification</span></p> <p>Section 3. Acceptable methods, techniques, and practices , Configuration 2</p> <p>For Configuration 2, it is written:  The installer shall set the quality indicators of the ADS-B extended squitter reports according to one of the following possibilities : (...)  — When none of the above conditions applies, the quality indicators are configured to report the quality indicators defined in ETSO-C199 in accordance with the instructions provided by the equipment manufacturer, typically with SDA = 0 and SIL = 1.  ***</p>

	<p>The last equipment seems to cover a Position Source that is not-approved by ETSO-C166a, and not meeting functional (and tests) requirements of both ETSO-C166a and DO-260A Corrigendum 1. Yet, it can assume a Source Integrity Level (SIL) of 1. What is the justification to assign a SIL of 1 to such an equipment?</p> <p>Should this equipment simply fall under the Configuration 3 (an ADS-B OUT system with a GNSS position source that is not approved)?</p> <p>Suggest to delete the statement below, if there is no substantive justification to keep it within Configuration 2:          — When none of the above conditions applies, the quality indicators are configured to report the quality indicators defined in ETSO-C199 in accordance with the instructions provided by the equipment manufacturer, typically with SDA = 0 and SIL = 1.</p>
response	<p>Partially accepted</p> <p>In Configuration 2, the GNSS is ETSO authorised. The SIL (source integrity level) is set to 1 for ETSO-C199. The GNSS is directly connected to the transponder. Then, the quality indicators are checked with ground tests. The only limitation is related to the design assurance standards for the extended squitter. This leads to SDA = 0.</p>

comment	<p>78 <span style="float: right;">comment by: <i>Garmin International</i></span></p> <p><b>CS-SC005b Page 37:</b></p> <p>The sixth condition for Configuration 1 states “The quality indicators are configured according to the principles specified in AMC 20-24”. We recommend this condition be expanded to allow SIL and SDA to be set as recommended by the transponder manufacturer.</p>
response	<p>Accepted</p> <p>The text has been adapted to reflect the principles of AMC 20-24 and to provide the typically setting values. This shall also be consolidated with the comment related to CS ACNS.D.ADSB (comment #56).</p>

comment	<p>79 <span style="float: right;">comment by: <i>Garmin International</i></span></p> <p><b>CS-SC005b Page 38:</b></p> <p>The fifth condition for Configuration 2 states “The installer follows the instructions from the manufacturer of the transponder to connect the GPS source.” The use of the term “GPS source” is inconsistent with other references in the section that use “GNSS receiver”. Suggest changing to “GNSS source” for consistency.</p>
response	<p>Accepted</p> <p>The proposed text has been accepted.</p> <p>Thank you</p>





comment	<p>127 ❖ <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span></p> <p>The mandate to establish maintenance intervals as required by the equipment manufacturer contradicts the possibility to organise maintenance on the aircraft with an applicable minimum inspection programme as defined in ML.A.302, or precisely as outlined in AMC1 ML.A.302(d).</p> <p>We suggest to streamline item 5 of this SC as has been done on CS-SC001:</p> <p><i>Amend the Instructions for Continued Continuing Airworthiness (ICAs) to establish maintenance actions/inspections and intervals, as required.</i></p>
response	<p>Accepted</p> <p>The proposed text, making this consistent with SC001, has been accepted.</p>
comment	<p>177 <span style="float: right;">comment by: <i>EUROCONTROL</i></span></p> <p>Section 2.3 Subpart B SC005</p> <p>Level - High</p> <p>"For configurations 2 and 3 that provide an 'aid to visual acquisition', the Minimum Aviation System Performance Standards (MASPSs) for ADS-B (see DO-242A Tables 2-7 and 2-8) do not require state vector (SV) quality parameters (NACp, NACv and surveillance integrity level (SIL))."</p> <p>Why is EASA referring to RTCA DO-242A when newer material exists in EUROCAE ED-194A/RTCADO-317C and ETSO-195b/TSO-195b. It should be noted that the requirements are different. The requirements should be aligned such that interoperability with ETSO'ed equipment is ensured/evaluated.</p>
response	<p>Partially accepted</p> <p>All references should be included. Configurations 2 and 3 aim to support airborne traffic awareness. The objective is to enable the GA community to benefit from units that might already be installed.</p> <p>Please, see also the responses to comments #184 and #185.</p>



The intended function relates to awareness:

- It 'brings traffic data to the GA cockpit'<sup>5</sup>.
- The installation conditions and restrictions in sections 2, 3 and 4 mitigate the hazards for the aircraft installation.
- The risk–benefit ratio is favourable according to the analysis performed for the 'awareness' systems, provided that the hardware will function in the environmental conditions to be expected during normal operation.

Various configurations bring various levels of quality. These levels of quality are also broadcast as quality indicators for subsequent usage by receiving applications.

comment

178

comment by: EUROCONTROL

Section 2.3 Subpart B SC005

Level - High

The text: "Detailed modifications in configuration 1: There was an error in the version of the ADS-B OUT technical standard. AMC 20-24 does not require ADS-B version 2."

This was not an error this was intended. Refer the specific comment on SC005 Configuration 1.

response

Partially accepted

AMC 20-24 does not require ADS-B version 2. In AMC 20-24, it is mandatory to have the ADS-B version number only if avionics is DO-260A compliant. Version 2 was required per ETSO-C166b. However, this requirement is not necessary for a function that aims to enhance pilot awareness. Such installation is not required by any regulation for eligible aircraft (certification or operation or airspace). The potential operational benefits are considered on top of the typical certification considerations. Please, see also the reply to comment #188 for configuration 1.

The 'version' of an ADS-B message can be interpreted even without the specific 'version' field. Alternatively, messages that do not contain the 'version' field can be discarded.

One possibility to correctly interpret the 'version' of an ADS-B message can consist of two steps:

- Check whether an aircraft is broadcasting ADS-B messages with TC=31 at all. If no message is ever reported, it is safe to assume that the version is Version 0.
- If messages with TC=31 are received, check the version numbers located in the 'ADS-B version number' (41-43 bit of the payload or 73-75 bit of the message).

After identifying the ADS-B version for an aircraft, one can decode the related Type Code TC=28, TC=29, and TC=31 messages accordingly.

<sup>5</sup> See EPAS 2020 – 2024 – Strategic priorities and key actions, <https://www.easa.europa.eu/downloads/111542/en>

The surveillance data exchange for ADS-B reports (<https://www.eurocontrol.int/sites/default/files/content/documents/nm/asterix/archives/asterix-cat021-asterix-ads-b-messages-part-12-v1.4-072009.pdf>) contains a data item for MOPS version. This data item can code the specific code to indicate that the MOPS version transmitted by the aircraft is not supported by the ground station.

comment

179

comment by: EUROCONTROL

Section 2.3 Subpart B SC005

Level High

The following text/reference does not provide a complete picture "This makes it possible for ADS-B IN installations (EUROCAE ED-164 SPR.34) to display aircraft equipped with configuration 2."

Appropriate and complete ref should at least be all applicable requirements. However the more appropriate reference would be EUROCAE ED-194A/RTCADO-317C and ETSO-195b/TSO-195b.

response

Partially accepted

comment

180

comment by: EUROCONTROL

Level High

There seems to be a misunderstanding with the intended use of configuration 2. It refers to that "Additionally, the FAA requires an SDA of 2 or 3 (see FAA AC 20-165 and 14 CFR § 91.227), while allowing experimental category aircraft to set the SDA in accordance with the equipment manufacturer's installation manual, provided the equipment has a statement of compliance with the performance requirements (see FAA AC 20-165B)." There is no basis or intention to provide ATC services to configuration 2 (TABS/ETSO-C199) while the text above refers to FAA requirements for equipment supporting ATC services!

Clarification of the intention with the updates to configuration 2 is needed!

response

Partially accepted

Standard Changes are not related to ATC services. This section aims to substantiate the settings for the quality indicators. Another intent is to provide information to pilots and/or community users. For example, a flying club could set up a ground receiving system to track aircraft. Such community networks are currently deployed (e.g. PilotAware ATOM GRID, OGN network, etc.).

Configuration 2 installation provides quality indicators that are defined in ETSO-C199. Frequency compliance is achieved with the Mode S transponder function. The Mode S transponder already includes a squitter. The 'extended squitter' ES format is capable of carrying much more data than the basic 'short squit' Mode S version. However, these types of aircraft are not required to be fitted with such a device. If the ES words cannot be decoded correctly on the ground, there is no 'surveillance'



impact since the Mode S part provides the aircraft position. In the air-to-air applications, ADS-B data is used for traffic awareness, thus the negative impact of an erroneous position is limited. Aircraft eligible for Configuration 2 do not have to be equipped with a certified CDTI. On the other hand, Configuration 2 promotes the installation of a reliable GNSS source (SIL=1 and SDA=1). There was an error in the text for the quality indicators. This has been corrected. In all cases, a traffic awareness installation only aims to enhance visual scanning. There is no guarantee that such an installation will correctly display all surrounding traffic in all conditions (e.g. aircraft manoeuvring, surrounding aircraft not electronically visible, etc.). The various configurations define various levels of quality together with some guidance for the AFM supplement.

comment	181	comment by: EUROCONTROL
	<p>Level - Medium</p> <p>"Therefore, hybrid ACAS/TCAS systems do not use ADS-B reports from configuration 2. Hybrid ACAS/TCAS systems do not benefit from passive surveillance with ADS-B reports from configuration 2."</p> <p>The text only applies for "Extended Hybrid" replace "hybrid" with "extended hybrid"</p>	
response	<p>Accepted</p> <p>No change is needed in SC005b.</p>	

comment	182	comment by: EUROCONTROL
	<p>Level - High</p> <p>The text "Per Appendix H, Part 3, Note 2, the SDA encoding of '2' applies to individual components of the ADS-B OUT system, i.e. '1' for the ADS-B transmit unit and '1' for the horizontal position and velocity source for an ADS-B OUT compliant installation." is incorrect.</p> <p>"Per Appendix H, Part 3, Note 2, the SDA encoding of '2' applies to individual components of the ADS-B OUT system, i.e. '2' for the ADS-B transmit unit and '2' for the horizontal position and velocity source for an ADS-B OUT compliant installation."</p>	
response	<p>Accepted</p> <p>Appendix H Part 3 of CS-ACNS Issue 2 is reproduced below. The reasoning was that both individual components had to be considered equally for the ADS-B OUT system. With a certified ETSO-C199 GNSS directly connected to the certified transponder, the value of '1' is applicable to each component. '1' and '1' lead to SDA=1. One part of the sentence was missing. The '1' was meant to apply to the standard change and not to Appendix H of CS-ACNS Issue 2. The reasoning from CS-ACNS Issue 2 was reused in the context of this Standard Change.</p>	



Appendix H

Part 3 – ADS-B Out Minimum Horizontal Position and Velocity Data Requirements

Table 20 provides a summary of the minimum horizontal position data requirements as specified in the defining ADS-B-RAD Safety and Performance Requirements/Interoperability document (ED-161).

Table 20: Minimum Horizontal Position and Velocity Data Quality Requirements

Quality Parameter	Requirement
Position Accuracy (NACp)	NACp<=185.2 m (0.1NM) (i.e. NACp>=7) for both 3 NM and 5 NM separation
Position Integrity Containment Radius (NIC)	3 NM Sep: NIC<=1 111.2 m (0.6 NM) (i.e. NIC>=6) 5 NM Sep: NIC<=1 852 m (1 NM) (i.e. NIC>=5)
Source Integrity Level (SIL)	SIL=3: 10 <sup>-7</sup> /flight-hour
System Design Assurance (SDA)	SDA=2: 10 <sup>-5</sup> /flight-hour - allowable probability level REMOTE (MAJOR failure condition, LEVEL C software and design assurance level)
Velocity Accuracy (NACv)	NACv<=10 m/s (i.e. NACv>=1)

Note 1: The requirement of NACp<=0.1NM in support of 3NM separation is based on the arguments produced in Annex B to ED-161 (ADS-B-RAD Safety and Performance Requirements/Interoperability Requirements Document).

Note 2: The SDA encoding of '2' (10<sup>-5</sup>/flight-hour) applies to individual components of the ADS-B Out system, i.e. 10<sup>-5</sup>/flight-hour for the ADS-B transmit unit and 10<sup>-5</sup>/flight-hour for the horizontal position and velocity source.

comment

183

comment by: EUROCONTROL

Level - High

The text: "The proposed modification deletes the requirement for the extended squitter part of the transponder, since this alleviation:"

How does EASA envisage to protect against incorrect transmissions? The spectrum risk is not even recognised as part of the considerations!

It should be clarified

response

Partially accepted

The explanation should be expanded. The RF transmission is protected by reference to the transponder in SC002d. The extended squitter is included in this RF transmission. The spectrum risk is covered by the ELS transponder. This explanation was summarised in the text: 'This ensures compliance with the frequency and transmission requirements.' The quality of the content of the extended squitter is defined by the quality indicators. These quality indicators are defined by the manufacturer according to applicable technical standards. For Configuration 2, quality indicators are those defined in ETSO-C199. An error in the text has now been corrected (comment #57). Errors during installation are covered by the ground test requirement that has now been moved to Section 3.



Standard Change CS-SC002d requires compliance with CS ACNS.D.ELS.010 of CS-ACNS for the transponder and the minimum specification from ETSO-C88a for the altitude encoder. One means of compliance with CS ACNS.D.ELS.010 (transponder characteristics) is ETSO-C112d. Other means of compliance are acceptable. However, they would imply demonstration of compliance. This is not possible with a Standard Change. A Standard Change is 'designed in compliance with these certification specifications, is not subject to an approval process, and, therefore, can be embodied in an aircraft when the conditions set out in the relevant paragraphs of Part 21 for the Standard Change are met'. In conclusion, parts used for the installation of the Mode S transponder need a recognised release certificate (Form 1 or equivalent). This is stated with reference to CS-SC002d.

comment 184 comment by: EUROCONTROL

Level - Medium

"does not make traffic with uncertified GPS positions visible to ADS-B IN systems compliant with FAA AC 20-165B." FAA AC 20-165B is not an appropriate reference for ADS-B IN systems.

The more appropriate reference would be EUROCAE ED-194A/RTCAD0-317C and ETSO-195b/TSO-195b.

response Partially accepted

All references should be included. There is currently no mandate in Europe for ADS-B IN in the SPI Regulation. Aircraft that would qualify for the installation of these Standard Changes would not be mandated to be equipped with ADS-B IN applications. The objective of this section is to provide background information on the rationale used for the changes. In Configurations 2 and 3, the focus is NOT ATC service or information but airborne traffic awareness. The reference to FAA AC 20-165B explains the reasoning that was used.

comment 185 comment by: EUROCONTROL

Level - Medium

"According to the EUROCAE ED-164 criteria for enhanced traffic situational awareness during flight operations, transmitting traffic is only displayed if SDA=1 or better (see EUROCAE ED-164 SPR.34 and SR.2)."

The more appropriate reference would be EUROCAE ED-194A/RTCAD0-317C and ETSO-195b/TSO-195b.

response Partially accepted

All references should be included. Configurations 2 and 3 focus on airborne traffic awareness. EUROCAE ED-194A includes a certified CDTI. Another display than a certified CDTI can complement this Standard Change.

comment 187 comment by: EUROCONTROL



	<p>Standard Change CS-SC005b</p> <p>Level Low</p> <p>The applicability text use non-precise language "provided that they do not have to comply with the ADS-B mandate (see Regulation (EU) No 1207/2011 as amended by Regulation (EU) No 1028/2014) and with Regulation (EU) 2017/386)",</p> <p>The text should refer to the regulation name instead of a non-precise name (ADS-B mandate).</p> <p>The text should also reflect that the regulation has been amended by a third regulation.</p> <p>"provided that they do not have to comply with the EU Regulation on performance and interoperability of surveillance (see Regulation (EU) No 1207/2011 as amended by Regulation (EU) No 1028/2014, Regulation (EU) 2017/386 and with Regulation (EU) No 2020/587)"</p>
response	<p>Accepted</p> <p>The same wording has been used as for comment #186.</p>

comment	<p>188 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level Medium</p> <p>The baseline for Config 1 should not to refer to AMC20-24. It is intended to be similar to v2 as per CS-ACNS.</p> <p>Clarify the baseline for this configuration.</p>
response	<p>Partially accepted</p> <p>AMC 20-24 was already the basis for the previous issue (Issue 3) of CS-STAN. This is sufficient for airborne traffic awareness for eligible aircraft. The version of the ADS-B can be decoded by ground applications. CS-STAN cannot be used to demonstrate compliance with CS ACNS.D.ADSB. AMC 20-24 is the minimum basis. Garmin comment #56 is accepted. It introduces the possibility to substitute conformity to AMC 20-24 by conformity to CS ACNS.D.ADSB. The SIL and SDA parameters are then set as recommended by the transponder’s manufacturer. Typical values are indicated for conformity to AMC 20-24. Aircraft that qualify for installation of this Standard Change do not currently receive a specific operational benefit from a ground service provided to a Version 2 ADS-B installation. On the other hand, aircraft that broadcast Version 1 ADS-B transmissions might be received by community stations and receivers. EASA does not aim to prevent aircraft from having a safety feature installed that can make them electronically visible at a reasonable cost. An upgrade of an</p>



ADS-B OUT with a specific version might be achieved through incentives. This Standard Change is voluntary anyway.

comment 189 comment by: EUROCONTROL

Standard Change CS-SC005b

Level Medium

The applicability of Configuration 1 should be recognised as "GA equivalent of CS-ACNS ADS-B" - this should be revisited now following the update of CS-ACNS.

Revise accordingly

response Partially accepted

Please see the response to comment #56.

The Standard Change might have to be updated if the next issue of CS-ACNS uses a different reference than CS ACNS.D.ADSB.

comment 190 comment by: EUROCONTROL

Standard Change CS-SC005b

Level High

Configuration 1 - ETSO-C166a must not be recognised under Configuration 1 for the following reasons:

1. CS-STAN configuration 1 has been recognised in ICAO material as being version 2, so also including version 1 will cause great confusion!
2. The requirements inclosing quality indicators are not correctly specified for version 1 systems - as currently written they violate the standards
3. It deviates from the objective to work towards recognition of this configurations as similar to CS-ACNS - i.e. a means to achieve equivalent performance for small aircraft

Undo the proposal to include ETSO-C166a and revert back to ETSO-166b. If similar configurations based on ETSO-C166a are to be included it should be clearly separated and the requirements must be aligned/correct to such configuration and the installer should be made aware that this configuration may not support ATC services in some areas.

response Partially accepted

The quality parameters are tailored to each configuration. The objective is to promote airborne traffic awareness. Receiving applications use the broadcast position and quality parameters. Those quality parameters are checked by ground tests.

comment 191 comment by: EUROCONTROL





	<p>Standard Change CS-SC005b</p> <p>Level High</p> <p>Configuration 2, the introduction/acceptance of version 1 ADS-B systems causes confusion with respect to the quality indicator configuration and makes it impossible to comply as currently written. Further the quality indicators are not in line with the ETSO itself...</p> <p>Update and clarify</p>
response	<p>Partially accepted</p> <p>The quality indicators for Configuration 2 are tailored to situational awareness.</p>
comment	<p>192 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level High</p> <p>Configuration 2, any indication of SDA&gt;1 for a TABS system is incorrect and not in line with the TABS ETSO and should not be indicated here.</p> <p>To be updated</p>
response	<p>Accepted</p> <p>There has been an error. 'SDA ≥ 1' is replaced by 'SDA=1'.</p> <p>Please see the response to comment #57.</p>
comment	<p>193 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level Medium</p> <p>Configuration 2. The statement "tests defined in EUROCAE ED-102A/RTCA DO-260A" is ambiguous as these are not the same version of the link</p> <p>Correct doc ref.</p>
response	<p>Accepted</p> <p>The references have been expanded.</p>
comment	<p>194 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level High</p>

response	<p>Configuration 2. The introduction of the 4 different options is really aimed to approve the same equipment but resulting in setting of different QI. This does not seem appropriate, what is the rationale for this.</p> <p>Discuss/clarify</p> <p>Partially accepted</p> <p>Configuration 2 aims to support and promote airborne situational awareness. The quality parameters match the characteristics of the combination of units. The SDA value in the first case of Configuration 2 has been corrected (please see the response to comment #57).</p>
comment	<p>195 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level High</p> <p>The last option (of the 4) seems to indicate a case where the ADS-B extended squitter function is not in compliance to anything. Why is it included and how does EASA envisage to protect against incorrect transmissions? It would seem that option 2 and 3 (if corrected/updated) would be sufficient.</p> <p>Consider removing 4th condition, or justify its need and how incorrect transmissions will be prevented.</p>
response	<p>Partially accepted</p> <p>Please see the response to comment #183.</p> <p>RF transmission is protected via compliance with SC002d. The quality indicators have been defined.</p>
comment	<p>196 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level Medium</p> <p>What is the purpose of the "Note: The values of the quality indicators are consistent with the equivalent combinations described in FAA AC 20-165B."</p> <p>To be clarified</p>
response	<p>Accepted</p> <p>This is for information. Aircraft certification also considers regulations from non-EU countries. ADS-B is widely used outside the Single Sky area. FAA AC 20-165B is cited or referenced in many guidelines.</p>



comment	<p>197 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level Low</p> <p>The statement "The ground test shall also include voluntarily transmitted ADS-B data (if any). This check satisfies the requirement for periodical maintenance that is referred to in AMC 20-24, Section 11." seems misplaced should testing not be in section 3 as it is for configuration 2.</p> <p>Align location related to ground test (section 3 vs section5)</p>
response	<p>Accepted</p> <p>Ground test has been moved to Section 3.</p> <p>Thank you</p>
comment	<p>198 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level Low</p> <p>The statement "The ground test shall also include voluntarily transmitted ADS-B data (if any)."</p> <p>Proposed text: "The ground test shall include all transmitted ADS-B and ELS data."</p>
response	<p>Accepted</p> <p>Indeed, even if ELS data is unchanged, the installation shall check that this is unchanged.</p> <p>Thank you</p>
comment	<p>199 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level Medium</p> <p>Missing ground test requirement (similar to conf 1 and 2) for configuration 3</p> <p>Add requirement</p>
response	<p>Accepted</p> <p>Ground test has been added with comment #198.</p> <p>Thank you</p>

comment	<p>200 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Standard Change CS-SC005b</p> <p>Level Medium</p> <p>The AFM text for the three configurations should be amended.</p> <p>The text "ADS-B OUT installation for airborne traffic awareness only" should be included for both config 2 and 3. The QI text "include information on the quality indicators" could be included for all (or non).</p> <p>For config 1 review the AMC20-24 compliance statement.</p>
response	<p>Partially accepted</p> <p>The AFM supplement shall be tailored to the installation and to the manufacturer's instructions. For Configuration 1, compliance with AMC 20-24 could be achieved by compliance with CS ACNS.D.ADSB (comment #56).</p> <p>The current text already includes compliance with AMC 20-24. This needs to be adjusted if compliance is achieved by compliance with CS ACNS.D.ADSB.</p> <p>Thank you for this. The proposed text has been added for Configuration 2.</p>
comment	<p>224 <span style="float: right;">comment by: DGAC France</span></p> <p>Page 38</p> <p>For configuration 2, The installer shall set the quality indicators of the ADS-B extended squitter reports according to several possibilities. In the last one, when none of the previous conditions applies, we wonder whether the word "typically" is appropriate before "with SDA = 0 and SIL = 1" (SDA is always 0 ?).</p>
response	<p>Accepted</p> <p>'typically' has been replaced by 'including'.</p>
comment	<p>238 <span style="float: right;">comment by: FNAM</span></p> <p><b>Position:</b> The changes made are clear and relevant: Favorable opinion. We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.</p> <p><b>Question:</b> In general, for CS-STANs, should a mechanic have a specific license for the maintenance task in question?</p>
response	<p>The transponder/ADS-B unit shall be installed with a Form 1. A certified GNSS shall be installed with a Form 1. Configuration 3 enables to install uncertified GNSS to broadcast own aircraft position. The aircraft is 'electronically' visible. The objective of Configuration 3 is like the transmission from an FLARM™ device. EASA acknowledges the concern for flight safety. However, EASA addresses this concern with the fact that the quality of the transmitted position is available to the receiver. If the price difference between certified and uncertified GNSS equipment became</p>

negligible, EASA expects users to favour certified GNSS units. No specific condition applies to the licence for the mechanic compared to other Standard Changes. The mechanic shall follow the manufacturer’s instructions for the transponder/ADS-B and the GNSS unit.

EASA has performed a theoretical assessment for the risk/benefit of units that are not required but could provide operational benefits.



Background-safety-benefit-awareness-syst

comment

312



comment by: Airbus Helicopters

Paragraph No:	Standard Change CS-SC005b INSTALLATION OF AN ADS-B OUT SYSTEM COMBINED WITH A TRANSPONDER SYSTEM / subparagraph 3 Acceptable methods, techniques and practices
Comment:	EASA wording proposal: “-The ADS-B transmit unit (transponder) is approved in accordance with ETSO-C166b, or later revisions, or the equivalent standards. -The GNSS installation is approved and the GNSS receiver is approved in accordance with: • ETSO-C129a, or • ETSO-C196a or ETSO-C145c or ETSO-C146c, or later amendments, or the equivalent standards” ETSO authorisation to be addressed instead of “approved in accordance with ETSO-Cxyz”
Rationale:	ETSO authorisation does not constitute an installation approval on an aircraft (see CS ETSO for details)
Proposed text:	“-The ADS-B transmit unit (transponder) is <b>authorised</b> approved in accordance with ETSO-C166b, or later revisions, or the equivalent standards. -The GNSS installation is approved and the GNSS receiver is <b>authorised</b> approved in accordance with: • ETSO-C129a, or • ETSO-C196a or ETSO-C145c or ETSO-C146c, or later amendments, or the equivalent standards”

response

Accepted  
 ETSO is an authorisation.  
 Thank you



comment	<p>13 <span style="float: right;">comment by: <i>Samionics / General Aviation Avionics</i></span></p> <p>We have been exchanging COM/NAV's since day 1 CS-SC001a (COM) + CS-SC056b (VOR).</p> <p>CS-SC052c installation of GNSS equipment clearly states the following:</p> <p>"For integrated systems that also provide voice communications functionality and/or VOR navigation capability, CS-SC052 may be applied concurrently with CS-SC001 and/or CS-SC056."</p> <p>So do we really need CS-SC006a?</p> <p>And if using CS-SC006a the installation would be limited to VFR so its better to use CS-SC001a + CS-SC056b.</p> <p>In case CS-SC006a is kept - remove the VFR limitation. Exchange of one COM/NAV for another should not limit the usage of the new equipment (VFR only).</p>
response	<p>Partially accepted</p> <p>Please see also the reply to comment #173 for a potential use.</p> <p>The initial intent was to have additional requirements for IFR. This initiative failed the internal review process. The community has very different perspectives as indicated in the comments. An installer can use any of the methods that are proposed for VFR.</p> <p>The proposal together with the supporting analysis are inserted here:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div data-bbox="453 1137 507 1196" style="text-align: center;">  <p>Standard Change CS NAVCOM.docx</p> </div> <div data-bbox="692 1137 746 1196" style="text-align: center;">  <p>Background Standard Change CS I</p> </div> </div>
comment	<p>28 <span style="float: right;">comment by: <i>KSAK - Swedish Royal Aero Club</i></span></p> <p>Since this is supposed to be done by a professional, and not the pilot-owner, we see no reason to have it limited to VFR installations. The job will be done just as good as if installed with an STC. That would absolutely help rare aircraft types that are not included in most AMLs.</p>
response	<p>Partially accepted</p> <p>Please see the response to comment #13.</p>
comment	<p>43 <span style="float: right;">comment by: <i>CAA CZ</i></span></p> <p>1) 1) Purpose: We suggest to explicitly say that this SC does not cover installation of a combined unit that includes a Flight Management System (FMS is widely understood as a part of NAV equipment today).</p> <p>2) 2) We also suggest to consider a note saying that: "This SC cannot cover installation of equipment that is already described in another SC (e.g. GNSS/GPS system)."</p>

response	<p>3) Limitations: We suggest to modify the sentence to "...that did not already exist in the AFM or AFMS."</p> <p>Accepted</p> <p>Text has been inserted or modified.</p> <p>Please see also the reply to comment #87.</p> <p>A note has been added. The text for the AFM has been changed.</p>
comment	<p>85 <span style="float: right;">comment by: DGAC France</span></p> <p>It should be better explained that the "NAV" part of the "NAV/COM" unit is for situational awareness only as this requirement only address VFR aircraft. VOR or ILS receivers are not covered by this requirement for example.</p>
response	<p>Partially accepted</p> <p>Since the NAV function is for awareness only, no further limitation is necessary. Typically, flying an ILS in VFR should not create a safety issue. The descent and lateral paths might be more accurate. A gross error of the ILS should be detected by the pilot. If the VFR pilot does not detect the gross error from the ILS, one wonders how the pilot could perform a stabilised approach. There is a remaining risk of overconfidence in the misleading ILS system. This remaining risk is to be counterbalanced by the additional benefit of stabilised approach.</p> <p>Please see also the change in the AFMS in the reply to comment #87.</p> <p>Thank you</p>
comment	<p>86 <span style="float: right;">comment by: DGAC France</span></p> <p>"Glass cockpit" should be defined somewhere in the CS to avoid any mis-interpretation of this requirement.</p>
response	<p>Accepted</p> <p>However, this is not easy to be defined. It is best defined through illustrative examples.</p> <p>Thank you</p>
comment	<p>87 <span style="float: right;">comment by: DGAC France</span></p> <p>4 Limitations : Shouldn't it be stated "AFM" instead of "AFMS"? It is understood that pre-change operational capability were stated in the AFM and should not be modified by AFMS content (no new capabilities)</p>
response	<p>Accepted</p> <p>Please see also the reply to comment #43.</p> <p>The text has been amended accordingly.</p> <p>Thank you</p>

comment	<p>88 <span style="float: right;">comment by: <i>DGAC France</i></span></p> <p>5 Manuals : NAV will be used for VFR only. Therefore a statement such as "NAV information to be used for situational awareness only" should be clearly added through AFMS.</p>
response	<p>Accepted</p> <p>The text has been added.</p> <p>Thank you</p>
comment	<p>149 <span style="float: right;">comment by: <i>Europe Air Sports</i></span></p> <p>Comment: CS-SC006a is limited to VFR day/night. This actually means that many of those aircraft most in need for an upgraded avionics package (i.e., used for IFR operations) cannot benefit from a cost-effective upgrade. The aircraft owner may therefore choose <i>not</i> to upgrade, continuing to use outdated equipment for the most critical operations (IFR). This does not seem consistent with the concept of «net safety benefit» as a regulatory path.</p>
response	<p>Partially accepted</p> <p>Please see the response to comment #13 for the extension to IFR.</p>
comment	<p>239 <span style="float: right;">comment by: <i>FNAM</i></span></p> <p><b>Position:</b> No comments: Neutral opinion. Addition of the recommendation to switch to RG400 antenna cables: Favorable opinion, little economic impact. We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.</p> <p>Why this CS STAN is limited to VFR aircraft? In fact, for VFR or IFR aircraft, the equipment is the same and the installation and test procedures as well.</p>
response	<p>Partially accepted</p> <p>Please see the response to comment #13 for the extension to IFR.</p> <p>A Form 1 is required for the units that broadcast in the aviation frequency band. A Form 1 is indeed required for the emitting units installed as part of SC006a. Please see also the replies to the comments on this SC. Thank you.</p>
comment	<p>298 <span style="float: right;">comment by: <i>Swiss Aeroclub</i></span></p> <p>The limitation to VFR operations should be reviewed. There is little reason that a NAV/COM unit creates hazardous failure cases simply because it is used for an IFR flight (we tend to say that instruments do not "sense" wether a flight is conducted under IFR or VFR).</p>



response Partially accepted  
Please see the response to comment #13 for the extension to IFR.

<b>Standard Change CS-SC031c</b>	p. 43
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comment 14 comment by: *Samionics / General Aviation Avionics*  
Please remove all information related to EASA Form 1 - this has absolutely no place in CS-STAN.

Component qualification regarding required documentation for installation in aircraft is addressed in Part-M/ML and Part-145, Part-CAO.

response Not accepted  
When EASA published NPA 2021-06 on 7 April 2021, it was in parallel working on another rulemaking task (RMT.0018<sup>6</sup>) that concluded with the adoption by the European Commission of Regulations (EU) 2021/699 and (EU) 2021/700. These Regulations permit the installation of components without an EASA Form 1 under certain conditions and when specified in CS-STAN. Therefore, CS-STAN is being amended to permit this possibility in certain Standard Changes, as explained in Section 2.3 (p. 8) of the NPA. When permitted in CS-STAN, the installation of parts without an EASA Form 1 will be possible when the above-mentioned Regulations will become applicable, i.e. on 18 May 2022.

comment 170 comment by: *Malte HOELTKEN*  
One of the possibilities of exchanging lighting to LED type lights is just to exchange the light bulbs. In many cases no changes to the electrical system or airframe is needed. We think these cases should be possible to be released by the pilot-owner, as the exchange of defective illuminates with the already installed types is within the scope of pilot-owner maintenance defined in AMC to Appendix II of Part-ML. We suggest to reformulate item 6 to:

*If no changes to the wiring or to the airframe structure is performed, this SC is suitable for the release by the pilot-owner. Changes to the electrical system beyond exchanging light bulbs and changes to the airframe structure are not suitable for the release by the pilot-owner.*

response Accepted

comment 240 comment by: *FNAM*  
**Position:** We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.

<sup>6</sup> <https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-21026-rmt0018-and-rmt0571>

response

Not accepted

These parts meet the condition in point 21.A.307(b)(4): 'in the case of the embodiment of a standard change [...] a part or appliance, for which the consequences of a non-conformity with its design data have a negligible safety effect on the product'. Lights are in most cases produced by non-aviation-specific manufacturers that do not hold a production organisation approval, and cannot issue an EASA Form 1.

comment

290

comment by: *European Sailplane Manufacturers*

It is understood that the function of lights is more important for aircraft which are not only operated in day-VFR conditions.  
But does this then really create a need for an EASA Form 1 for such lights?

It would be great if the often technical much superior LED-type lights could replace the sometime sub-optimal lightbulbs also for aircraft used at night and in IFR conditions without requiring the LED light manufacturer to take all the efforts to get into a position where those could be delivered with an EASA Form 1.

response

Not accepted

When position or anti-collision lights are required by operational rules, the certification specifications require an approved anti-collision light system. This is interpreted as meeting the applicable ETSO, which in turn requires production of anti-collision lights by a POA holder.

**Standard Change CS-SC032b**

p. 45

comment

7

comment by: *Samionics / General Aviation Avionics*

"where the greatest dimension is no longer than 50 mm"

So a small part can be 5cm x 5cm x 5 cm (125cm<sup>2</sup>) but not

16cm x 10cm x 0.15cm (24cm<sup>2</sup>) such as an ABS plastic sheet used to cover avionic stack holes or instrument panel covers.

response

Partially accepted

This comment is related to CS STAN.45, instead of CS-SC032b.

CS STAN.45 has been changed, and the 'dimension is no longer than 50 mm' has been removed from the sentence concerning small parts in general. The conditions had an error of logic. The idea was to distinguish the electronic components from the rest.

comment

150

comment by: *Europe Air Sports*

We do not understand why installation is only allowed on wings without any sweep angle. Please keep in mind that many general aviation aircraft types have a small sweep angle, and also negative sweep angles are used. Please reconsider.



response	<p>Not accepted</p> <p>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 with them — this is why the requirements have been simplified to the maximum extent. Sweep angle has an effect on coupling bending-torsion flexural modes. Considering that many applicants are not familiar with the basics, EASA believes that this limitation is necessary.</p>
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comment	<p>241</p> <p><b>Position:</b> No comments: Neutral opinion.</p>	comment by: <i>FNAM</i>
response	Noted	

**Standard Change CS-SC033 a b**

p. 47

comment	<p>242</p> <p><b>Position:</b> No comments: Neutral opinion.</p>	comment by: <i>FNAM</i>
response	Noted	

**Standard Change CS-SC034 b c**

p. 49

comment	<p>29</p> <p>We hope that the wording "— It must be possible for the pilot to cut the battery off from the electric system in flight." means a standard master battery switch that is found in most aircraft. It should probably be explained a bit more to avoid confusion.</p>	comment by: <i>KSAK - Swedish Royal Aero Club</i>
response	<p>Accept</p> <p>An explanatory note has been added.</p>	

comment	<p>130</p> <p>This SC limits the installation of a LiFePO<sub>4</sub> battery to a system of 160 Wh. We suggest to remove this restriction.</p> <ol style="list-style-type: none"> <li>1. It is not clear if this is intended to limit the complete battery installation within the aircraft, or to single battery and battery management system-units.             <ol style="list-style-type: none"> <li>1. If the intent were to limit the complete system, sailplanes with two batteries would need to operate aircraft batteries of different technologies, since the limit of 160 Wh is often not sufficient to power a modern sailplane cockpit over the time of long competition flights. This way, the glider pilot might be forced to turn off safety</li> </ol> </li> </ol>	comment by: <i>Malte HOELTKEN</i>
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relevant equipment such as transponders or awareness lights / beacons.

2. If the limit on the other hand is intended to limit not the complete installed capacity, but rather the size of a single "battery plus management system"-unit, the safety thought can be invalidated by placing these battery packs side by side, a common positioning of multiple batteries in sailplanes. Furthermore, a set of multiple batteries necessitates a battery switching unit and additional wiring. As it is a basic principle in aviation safety to reduce the part count to reduce failure opportunities, it is seen as more prone to safety-relevant errors and failures than removing the 160 Wh limit on a single battery unit.
2. Unlike LiCoO<sub>2</sub> batteries, LiFePO<sub>4</sub> batteries can be regarded as being intrinsically safe. They are chemically and thermally stable, incombustible and more tolerant to short circuit conditions than Lithium-Ion technology batteries. The removal of the 160 Wh limit would not pose an increased safety risk.

This SC prohibits the installation of LiFePO<sub>4</sub> starter batteries. We suggest to remove this limitation for installations that do not charge the battery inflight.

Based on the arguments mentioned above, LiFePO<sub>4</sub> battery systems with an appropriate battery management system can be regarded as safe. This is also true for batteries suitable for the delivery of higher currents.

If the starter battery is not recharged inflight, as it is the case for most self-launching and sustaining powered sailplanes, the possible overcharge situation of a voltage regulator designed for lead batteries is not given.

Our assessment is based on the following literature:

EE Safety Presentation: <http://extraenergy.org/files/AlastairJohnston-Valence-Saphion.pdf>

[https://www.ijsr.net/conf/ATOM2014/ATOM2014\\_03.pdf](https://www.ijsr.net/conf/ATOM2014/ATOM2014_03.pdf)

<https://www.mpoweruk.com/lithiumS.htm>

response

Not accepted

The limit of 160 Watt in Section 4 remains unchanged since the first issue of this Standard Change, and it is based on limiting the risk for Standard Changes, and in line with the EASA policy for PEDs on board aircraft, where this limit and chemistry are considered quite safe even if a thermal runaway occurs.

This level is not for the complete system (point 1.1 of the comment); it is the limit per battery unit installed and replaced, so it is not allowed to replace batteries of higher capacity by dividing them in submodules (point 1.2 of the comment).

LiFePO<sub>4</sub> batteries can be regarded as being safer than other lithium chemistries (point 2 of the comment), and this is the reason why it is allowed in this Standard Change only for this kind of chemistry; however, thermal runaway is still a risk in this chemistry and this is why EASA has limited the capacity and the function (nor starter neither propulsion batteries).



The limitations are for this Standard Change, but there is no prohibition against using higher capacities or other chemistries or for starter batteries — but if this is the case, the applicant will have to apply to EASA for a certification process as the risks involved are much higher.

comment 151 comment by: *Europe Air Sports*

Comment:  
 Standard Change CS-SC034c is limited to «a maximum capacity of 160 Wh». Depending on the relevant voltage, this could equate to 13 Ah. However, 13 Ah is hardly a standard size for batteries, while 10 Ah and 20 Ah are. In our view, 10 Ah is insufficient for sailplanes with modern electronic equipment.  
 Therefore, we suggest a limit of 260 Wh (or ideally 300 Wh) instead. With regard to safety, this should pose no hazard greater than is already allowed through type certificated equipment from DG and Alexander Schleicher.

response Not accepted  
 The limit of 160 Watt in Section 4 remains unchanged since the first issue of this Standard Change, and it is based on limiting the risk for Standard Changes, and in line with the EASA policy for PEDs on board aircraft, where this limit and chemistry are considered quite safe even if a thermal runaway occurs.  
 This level is not for the complete system (point 1.1 of the comment), it is the limit per battery unit installed and replaced.  
 The limitations are for this Standard Change, but there is no prohibition against using higher capacities or other chemistries or for starter batteries — but if this is the case, the applicant will have to apply to EASA for a certification process as the risks involved are much higher.

comment 243 comment by: *FNAM*

**Position:** No comments: Neutral opinion.

response Noted

**Standard Change CS-SC035 a b** p. 51

comment 152 comment by: *Europe Air Sports*

We propose use of the wording "short circuits" instead of "shortcuts".

response Accepted

comment 244 comment by: *FNAM*

**Position:** No comments: Neutral opinion.

response Noted



comment	291	comment by: <i>European Sailplane Manufacturers</i>
	We are not English native speakers but a short cut is no short circuit or short? Use better "short circuit".	
response	Accepted	

**Standard Change CS-SC036 a b**

p. 53

comment	153	comment by: <i>Europe Air Sports</i>
	We propose use of the wording "short circuits" instead of "shortcuts".	
response	Accepted	

comment	245	comment by: <i>FNAM</i>
	<b>Position:</b> We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.	
response	Not accepted  These parts meet the condition in point 21.A.307(b)(4): 'in the case of the embodiment of a standard change [...] a part or appliance, for which the consequences of a non-conformity with its design data have a negligible safety effect on the product'. Lights are in most cases produced by non-aviation-specific manufacturers that do not hold a production organisation approval, and cannot issue an EASA Form 1.	

comment	292	comment by: <i>European Sailplane Manufacturers</i>
	We are not English native speakers but a short cut is no short circuit or short? Use better "short circuit".	
response	Accepted	

**Standard Change CS-SC037b**

p. 56

comment	30	comment by: <i>KSAK - Swedish Royal Aero Club</i>
	We want this to also include lithium ion batteries.	
response	Not accepted  Due to the specific risks of lithium batteries, changes involving this are handled through change processes, not by the Standard Changes of CS-STAN.	

comment	172	comment by: <i>Malte HOELTKEN</i>
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	This SC is not suitable for lithium batteries. We suggest to include the installation of LiFePO4 batteries, as long as compliance to SC-ELA.2015-01 can be shown by the person responsible for the embodiment of the SC.
response	Not accepted  Due to the specific risks of lithium batteries, changes involving this are handled through change processes, not by the Standard Changes of CS-STAN.
comment	246 <span style="float: right;">comment by: <i>FNAM</i></span>  <b>Position:</b> No comments: Neutral opinion.
response	Noted

**Standard Change CS-SC038b**

p. 57

comment	247 <span style="float: right;">comment by: <i>FNAM</i></span>  <b>Position:</b> We are not in favor of not checking the conformity of the equipment if it has a CE marking. Indeed, the CE marking is not a guarantee of total conformity, and these could compromise flight safety: Unfavorable opinion.  <b>Question:</b> It is specified that the person in charge of installing the DC to DC must verify that the equipment does not appear on the hazardous products site (index 40). At what point should we check that the equipment does not appear on this list? This list is updated daily, should equipment monitoring be set up by the airworthiness management organization? If so, how and how often?
response	This amended SC replaces the requirement for ETSO-C71 since few products are available and such products are designed for 'air carrier aircraft'.  At the time of drafting this SC, there were only 2 products having an ETSO C71 authorisation ( <a href="https://www.easa.europa.eu/download/ets/etsoa.pdf">https://www.easa.europa.eu/download/ets/etsoa.pdf</a> ). Therefore, this is not a practical solution.  On the other hand, if pilots take a DC-DC converter on board aircraft, this creates a hazard of a moving object in the cockpit.  This SC replaces the ETSO condition with CE marking and a check that this product is not on the list of dangerous goods. The degradation of DC-DC converters on avionics systems ( <a href="https://www.researchgate.net/publication/241195106_Effects_of_Degradation_in_DC-DC_Converters_on_Avionics_Systems_A_Model_Based_Approach">https://www.researchgate.net/publication/241195106_Effects_of_Degradation_in_DC-DC_Converters_on_Avionics_Systems_A_Model_Based_Approach</a> ) essentially creates glitches on connected equipment. In the scope of this SC, the DC-DC converter is not used for essential avionics systems.  In conclusion, portable DC-DC converters can create serious hazards when moving in the cockpit compared to permanent installation. Compliance to European standards for fixed installation and absence of safety alert intend to mitigate the residual installation risks. The installer adds identification of the product so that safety alerts on the product can



be identified after installation, if necessary. A no-credit installation is safer than a carry-on uncontrolled solution. These parts can be installed without a Form 1 or equivalent.

This requirement implies that this is checked when installing the DC-DC converter: ‘The installer checks that the DC-to-DC converter to be installed is not listed in the rapid alert system for dangerous non-food products.’

This requirement enables to regularly check that the product has no safety alert: ‘The product name, type/number of model and pertinent information that can be subsequently used to check safety alerts, if necessary, are recorded, or referred to, in EASA Form 123.’

comment

313

comment by: *Airbus Helicopters*

Paragraph No:	Standard Change CS-SC038b INSTALLATION OF DC-TO-DC CONVERTORS / subparagraph 1 Purpose
Comment:	EASA wording proposal “aircraft systems that are required to comply with airspace regulations” is beyond the scope of Regulation (EC) No 551/2004 / Organisation and use of the airspace in the single European sky (addressed as airspace regulation within EASA basic regulation)
Rationale:	Aircraft systems are required to comply with airworthiness or air operations rules. Performance and Interoperability requirements e.g. EU 1207/2011 address additional criteria to be fulfilled by airborne equipment instances. Commission Regulation EC 551/2004 does not address aircraft systems.
Proposed text:	“aircraft systems that are <b>required within Standardised European Rules of the Air</b> <del>required to comply with airspace regulations</del> ”

response

Accepted  
The proposed text has been used.

**Standard Change CS-SC051d**

p. 59

comment

59

comment by: *Garmin International*

**CS-SC501d Page 60:**

The sixth condition states “Installation and maintenance follow the instructions provided by FLARM® Technology Ltd”. This SC is applicable to equipment embedding FLARM technology and therefore installation and maintenance instructions may be provided by the equipment manufacturer instead of FLARM® Technology Ltd.

We suggest restating this to “Installation and maintenance follow the instructions provided by the manufacturer”.





response	Accepted
comment	<p>89 <span style="float: right;">comment by: DGAC France</span></p> <p>4 Limitations : <i>"FLARM installations cannot generate alerts that mask other alerts generated by other rotorcraft systems which need more immediate action. "</i></p> <p>The chosen wording ("mask") is not deemed as clear enough. Suggestion: "FLARM installations generated alerts must be inhibited in case of alerts generated by other aircraft systems which need more immediate action".</p> <p>Why limiting this requirement to rotorcraft (it should be "aircraft")?</p> <p>It is not clear who will be responsible for conducting the assessment of alerts' priority. As such, shouldn't it be specified a minimum set of alerts (TCAS, TAWS, stall ...) that will take precedence over FLARM alerts? This minimum set of alerts will be completed depending on the results of previously mentioned assessment.</p> <p>This raises the question of the potential need for inhibition of FLARM alerts in specific operational conditions. Shouldn't the SC clarify that inhibition proper functioning shall be verified at some point (a check flight would not be appropriate for that purpose)?</p>
response	<p>Partially accepted</p> <p>The limitation has originated from rotorcraft to consider certain warnings that may be more critical for safe flight than a warning about surrounding traffic or a nearby obstacle.</p> <p>The available safety data does not justify the extension of the requirement to other categories of aircraft (e.g. aeroplanes, sailplanes, etc.).</p> <p>EASA agrees to replace the word 'mask' as suggested.</p>
comment	<p>117 <span style="float: right;">comment by: DGAC France</span></p> <p>General comment :</p> <p>4 Limitations</p> <p>What is the rationale to modify SC by Standard Change while SC term is used in all others SCs ? SC term should be kept here.</p>
response	<p>Noted</p> <p>The change has been removed.</p>
comment	<p>230 <span style="float: right;">comment by: FLARM Technology</span></p> <p>The NPA proposes to add the following sentence under <i>Section 4. Limitations</i>:</p> <p><i>The use of FLARM is limited to prompting an additional visual scan for surrounding traffic and/or obstacles.</i></p>

While we agree with the essential premise that visual acquisition should be the first priority, there are situations where the traffic cannot be seen under any circumstance, e.g. due to a blind spot. The addition of this sentences would hence be counterproductive in these cases. As many professional FLARM users (e.g. flight instructors) will testify, it is extremely important to **do something** if the other aircraft cannot be visually acquired following a collision warning. This is exemplified by the following published interview with the Chief Flight Instructor of Basel Flight School:

<https://flarm.com/learning-series-basel-flight-school/>

FLARM collision warnings are very precise and selective. Collision warnings are only issued when the predicted flight paths, with a small margin, actually intersect. False positives are rare based on experience from an estimate of over 100 million flight hours. The warnings start 18 seconds before the collision and consists of three warning levels, depending on time to impact. The margin also decreases with each level. When the third warning level is reached, which starts 6 seconds before impact, the probability of a collision is very high if neither aircraft changes their flight path. To then continue as if nothing happened would be reckless.

The first action when a collision warning is issued is to try to visually acquire the other aircraft. Because of the inherent limitations of see-and-avoid, including the human visual system and the limited cockpit visibility from a typical general aviation aircraft, there is a high probability that the other aircraft cannot be visually acquired. This has maybe best been summarized by Hobbs (1991). There are also many examples of such occurrences in accident and incident reports, often when the other aircraft was in the blind spot (e.g. below or behind). Examples include two reports by the Swiss Transportation Safety Investigation Board (2016, 2021). If the collision warning continues without the other aircraft having been visually acquired, it is essential to change either course or altitude, following the rules of the air. This is also at least as applicable to obstacle warnings, many of which (e.g. cables and power lines) are impossible to see even at close range.

The proposed sentence implies (intentionally or not) that the pilot may not change the flight path based only on FLARM collision warnings, or even traffic information before a collision warning is issued. If pilots would take this seriously, it would lead not only to an increase in mid-air collisions but could have legal implications. SERA.3201 states that *“Nothing in this Regulation shall relieve the pilot-in-command of an aircraft from the responsibility of taking such action [...] as will best avert collision”* (the non-exhaustive example of ACAS RA has been removed for readability). This implicitly implies using all available information to make such decisions.

**The proposed sentence is incorrect, dangerous, and conflicts with SERA.3201. It should therefore be removed.** Since FLARM does not issue any resolution advisories or similar, there is also no need to make a statement similar to that in the proposed CS-SC057a.

Similarly, the NPA proposes to add the following sentence under *Section 1. Purpose* in the Note:



*FLARM devices are not referred to in the Standardised European Rules of the Air, in the Annex 'Rules of the Air', Section 3, Chapter 2, point SERA.3201.*

This is incorrect. It is only the subordinate clause “including [...]” that does not refer to FLARM since it explicitly refers to ACAS. The point more generically refers to any and all actions to avert collisions (“such action [...] as will best avert collision”). As previously stated, this implicitly implies using all available information to make such decisions. Any other interpretation would imply that it would be prohibited to change course or altitude e.g. based on information from ATC, callouts from other aircraft, etc. The fact that FLARM is not ACAS is self-evident and also already stated in the Note. **This proposed sentence should be removed as well.**

If it is considered indispensable to add a sentence about avoidance maneuvers, we propose the following sentence, which could be added e.g. under *Section 4. Limitations*:

***No information or annunciation received from FLARM, or lack thereof, should be taken to imply a suggested action to avert collision.***

#### References

Hobbs, A. (1991). *Limitations of the see-and-avoid principle*. Australian Transport Safety Bureau.

STSB. (2016). *Schlussbericht Nr. 2238*. Swiss Transportation Safety Investigation Board.

[https://www.sust.admin.ch/inhalte/AV-berichte/2238\\_d.pdf](https://www.sust.admin.ch/inhalte/AV-berichte/2238_d.pdf)

STSB. (2021). *Summarischer Bericht*. Swiss Transportation Safety Investigation Board.

[https://www.sust.admin.ch/inhalte/AV-berichte/HB-VZZ\\_vs\\_D-KAVE\\_sumB\\_D.pdf](https://www.sust.admin.ch/inhalte/AV-berichte/HB-VZZ_vs_D-KAVE_sumB_D.pdf)

response

Partially accepted

The text has been amended as follows:

‘The use of FLARM is limited to prompting additional crew actions in accordance with the rules of the air to try to acquire visual contact with surrounding traffic and/or obstacles.’

The following sentence has been deleted:

‘FLARM devices are not referred to in the Standardised European Rules of the Air, in the Annex ‘Rules of the Air’, Section 3, Chapter 2, point SERA.3201.’

comment

232

comment by: *FLARM Technology*

*Section 5. Manuals* states that the AFMS shall include “limitations, warnings and placards, at least, for the following:” and lists three such items. Especially with the addition of the third item, it is unclear if these items need to be placards or only limitations stated in the AFMS. **This should be clarified if the following proposals are not accepted.**



The first two items, before the proposed change, were suitable as placards. The amended first item “For traffic and obstacle situational awareness only” is, however, unsuitable as placard as it is too long to be readable in the font size required to fit it next to a FLARM display. The text is also too specific for a placard. **The old placard “For situational awareness only” (or more correctly “For situation awareness only”) is more suitable and sufficient.**

The third, new item (“It detects only aircraft which are equipped with compatible systems”) is also too long, not suitable as a placard without being rewritten, and incorrect. Most FLARM systems installed today also detect ADS-B Out and transponder Mode-S equipped aircraft. These systems are, arguably, not “compatible systems”. Even if it may be technically argued that they are compatible since they are being received, such an interpretation would be a tautology and hence meaningless. **The third item should be removed. Instead, we propose to amend the first list item in the main section list to read “a description of the system, its operating modes and functionality, and the systems with which it is interoperable”.** A placard is not meaningful since unless it would list all interoperable systems (which is not possible in the limited space) it would be tautological.

response

Partially accepted

AFM-related text has been amended as follows:

‘Amend the AFM with an AFMS to include, at least, the following:

- a description of the system, its operating modes and functionality, and information about interoperable systems;
- limitations, warnings and placards, at least, for the following:
  - ‘for situational awareness only’;
  - ‘use in day VFR only’ for aircraft which are approved for operations beyond day VFR;
  - the normal and emergency operating procedures; and
  - instructions for carrying out software and database updates.’

comment

248

comment by: *FNAM*

**Position:** No comments: Neutral opinion.

response

Noted

comment

314

comment by: *Airbus Helicopters*

Paragraph No:	Standard Change CS-SC051d INSTALLATION OF “FLARM” EQUIPMENT / subparagraph 3 Acceptable methods, techniques and practices
Comment:	EASA wording proposal: “Data bus/data connectivity between the FLARM device and other equipment which is: <ul style="list-style-type: none"> <li>• ETSO- authorised (or the equivalent authorisation); or</li> <li>• required by the TCDS, AFM or POH; or</li> </ul>



	<ul style="list-style-type: none"> <li>• required by other applicable requirements such as those for operations and airspace, is not allowed unless the FLARM device is explicitly recognised by the manufacturer of the other equipment listed by its manufacturer as compatible equipment to which the other equipment can be connected.” Does not address information security protection. The comment is raised assuming that the FLARM installation under discussion is part of threat scenario leading to failure conditions higher than minor.</li> </ul>
Rationale:	CS ETSO criteria for information security protection already address security assurance for ETSO articles.
Proposed text:	<p>Data bus/data connectivity between the FLARM device and other equipment which is:</p> <ul style="list-style-type: none"> <li>• ETSO- authorised (or the equivalent authorisation); or</li> <li>• required by the TCDS, AFM or POH; or</li> <li>• required by other applicable requirements such as those for operations and airspace,</li> </ul> <p>is not allowed unless the FLARM device is explicitly recognised by the manufacturer of the other equipment.</p> <p>Note: Equipment manufacturer “FLARM recognition” address overall compatibility, digital communication interfaces and information security protection aspects.</p>
General remark:	Addressing a private company name and ICA documents within European Agency certification specifications may be beyond rule making.

response

Partially accepted

The note has been modified as follows:

‘The recognition of FLARM by the equipment manufacturer has to address the overall compatibility and digital communication interfaces, and information security protection aspects, if the latter is applicable.’

Please, see also the reply to comment #59.

**Standard Change CS-SC052d**

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comment

31

comment by: *KSAK - Swedish Royal Aero Club*

Since this is supposed to be done by a professional, and not the pilot-owner, we see no reason to have it limited to VFR installations. The job will be done just as good as if installed with an STC. That would absolutely help rare aircraft types that are not included in most AMLs.



response	<p>We want to make it easier to upgrade your aircraft with new equipment. We also want you to remove the restriction on interaction with AFCS. This is to be done by a professional anyway.</p> <p>Partially accepted</p> <p>The eligibility of SC057a is transposed into this SC. This makes it possible to exchange the GNSS unit for an IFR unit.</p>
comment	<p>60 <span style="float: right;">comment by: <i>Garmin International</i></span></p> <p><b>CS-SC052d Page 62:</b></p> <p>The Purpose section states “Furthermore, this SC does not cover the connection of the GNSS equipment to any kind of AFCS, nor to an ADS-B OUT system” CS-SC052d does not specify functional or performance requirements. As such, it seems this SC includes GNSS equipment that may meet the position source requirements of Configurations 1, 2, or 3 in CS-SC005b. It is unclear why this SC is not allowed to be applied concurrently with CS-SC005b if the GNSS equipment meets the position source requirements of Configurations 1, 2, or 3. Additionally, it appears equipment allowed under CS-SC052d can support the Aircraft Position element of Electronic Conspicuity Function as defined in CS-SC057a.</p> <p>We encourage the agency to allow CS-SC052d concurrently with CS-SC005b provided the GNSS equipment meets the position source requirements of the applicable CS-SC005b configuration. We further encourage the agency to allow CS-SC052 concurrently with CS-SC057a.</p>
response	<p>Accepted</p> <p>Modifications have been made to enable to apply CS-SC052() concurrently with CS-SC005() and/or CS-SC057().</p>
comment	<p>61 <span style="float: right;">comment by: <i>Garmin International</i></span></p> <p><b>CS-SC052d Page 62:</b></p> <p>In Section 3, the first condition states “The GNSS in this SC is eligible for installation without an EASA Form 1.” If this SC is allowed to be installed concurrently with CS-SC005b, the agency should consider requiring EASA Form 1 for GNSS installed as position source for CS-SC005b Configuration 1 or Configuration 2.</p> <p>As we commented earlier, this CS seems to allow GNSS equipment that may meet the position source requirements of Configurations 1, 2, or 3 of CS-SC005b. We encourage the agency to allow CS-SC052d concurrently with CS-SC005b provided the GNSS equipment meets the position source requirements of the applicable CS-SC005b configuration.</p>
response	<p>Accepted</p> <p>The SC has been modified accordingly.</p>

comment	<p data-bbox="368 183 416 241">62</p> <p data-bbox="963 183 1394 241" style="text-align: right;">comment by: <i>Garmin International</i></p> <p data-bbox="368 248 624 293"><b>CS-SC052d Page 63:</b></p> <p data-bbox="368 315 1394 510">In Section 4, the first limitation states “The system is to be used for situational awareness only”. If this CS is allowed to be installed concurrently with CS-SC005b, this limitation should be expanded to allow the system to provide position to an ADS-B System provided the GNSS equipment meets the position source requirements of the applicable CS-SC005b configuration.</p> <p data-bbox="368 533 1394 734">As we commented earlier, this CS seems to allow GNSS equipment that may meet the position source requirements of Configurations 1, 2, or 3 of CS-SC005b. We encourage the agency to allow CS-SC052d concurrently with CS-SC005b provided the GNSS equipment meets the position source requirements of the applicable CS-SC005b configuration.</p>
response	<p data-bbox="368 734 496 779">Accepted</p> <p data-bbox="368 786 847 831">The SC has been modified accordingly.</p>
comment	<p data-bbox="368 898 416 943">63</p> <p data-bbox="963 898 1394 943" style="text-align: right;">comment by: <i>Garmin International</i></p> <p data-bbox="368 949 624 994"><b>CS-SC052d Page 63:</b></p> <p data-bbox="368 1016 1394 1211">In Section 5, the second item to be included in the AFMS is “This equipment is to be used for situational awareness only”. If this CS is allowed to be installed concurrently with CS-SC005b, this limitation should be expanded to allow the system to provide position to an ADS-B System provided the GNSS equipment meets the position source requirements of the applicable CS-SC005b configuration.</p> <p data-bbox="368 1234 1394 1449">As we commented earlier, this CS seems to allow GNSS equipment that may meet the position source requirements of Configurations 1, 2, or 3 of CS-SC005b. We encourage the agency to allow CS-SC052d concurrently with CS-SC005b provided the GNSS equipment meets the position source requirements of the applicable CS-SC005b configuration.</p>
response	<p data-bbox="368 1449 496 1494">Accepted</p> <p data-bbox="368 1500 847 1545">The SC has been modified accordingly.</p>
comment	<p data-bbox="368 1612 416 1657">80</p> <p data-bbox="963 1612 1394 1657" style="text-align: right;">comment by: <i>Garmin International</i></p> <p data-bbox="368 1664 624 1709"><b>CS-SC052d Page 62:</b></p> <p data-bbox="368 1731 1394 1939">The Purpose section states “For integrated systems that also provide voice communications functionality and/or VOR navigation capability, CS-SC052() may be applied concurrently with CS-SC001() and/or CS-SC056()” It is unclear why CS-SC006a (combined VHF voice communication and navigation) is not included. The agency should consider adding CS-SC006a() to this sentence.</p>
response	<p data-bbox="368 1939 496 1984">Accepted</p>

All these modifications have resulted in rewriting several sections of several SCs.

comment 90 comment by: DGAC France

3 Acceptable methods, techniques, and practices  
"FAA Advisory Circular AC 20-138D, including Change 1 and Change 2, Appendix 6, with the exception of paragraphs A6-4.c and A6-4.f."

Appendix 6 limit the GNSS equipment to VFR use only. Not consistent with following chapters of this requirement.

response Accepted

Appendix 6 only applies to 'for VFR use only'.

comment 91 comment by: DGAC France

3 Acceptable methods, techniques, and practices  
AC 43.13-2B (. instead of AC 43-13-2B)

To be modified in all CS-STAN document.

response Accepted

The text has been amended.

Thank you

comment 92 comment by: DGAC France

4 Limitations :  
What would be the rationale to authorised such a GNSS equipment on a IFR aircraft ?  
It should be in EASA interest to encourage IFR operators to install certified GNSS receivers.  
"Under VFR only" should not be deleted.

§2. Applicability should add that this requirement is limited to VFR use only.

response Partially accepted

Please, see the responses to comments #32, #94, #300 and #316 on SC057().

comment 249 comment by: FNAME

**Position:** We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.

response Partially accepted

Please, see also the reply to comment #60.





Several options are proposed, depending on the intended usage.  
Please, also note that the GNSS receiver without a Form 1 has restrictions for 'data connectivity'.

comment	<p>315 <span style="float: right;">comment by: Airbus Helicopters</span></p> <table border="1" style="width: 100%;"> <tr> <td style="width: 20%;">Paragraph No:</td> <td>Standard Change CS-SC052d INSTALLATION OF GNSS EQUIPMENT / subparagraph 3 Acceptable methods, techniques and practices</td> </tr> <tr> <td>Comment:</td> <td> <p>EASA wording proposal: "Data connectivity with the installed equipment and other equipment which is:</p> <ul style="list-style-type: none"> <li>• required by the TCDS, AFM or POH,</li> <li>• required by other applicable requirements such as those for operations and airspace, or</li> <li>• mandated by the respective MEL, if this exists,</li> </ul> <p>is not allowed unless the equipment that is being installed is explicitly listed by its manufacturer as compatible equipment to which the other equipment can be connected." Does not address information security protection. The comment is raised assuming that the GNSS installation under discussion is part of threat scenario leading to failure conditions higher than minor.</p> </td> </tr> <tr> <td>Rationale:</td> <td>CS ETSO criteria for information security protection already address security assurance for ETSO articles.</td> </tr> <tr> <td>Proposed text:</td> <td> <p>is not allowed unless the GNSS equipment that is being installed is explicitly listed by its manufacturer as compatible equipment to which the other equipment can be connected</p> <p>Note: GNSS equipment manufacturer list address overall compatibility, digital communication interfaces and information security protection aspects.</p> </td> </tr> </table>	Paragraph No:	Standard Change CS-SC052d INSTALLATION OF GNSS EQUIPMENT / subparagraph 3 Acceptable methods, techniques and practices	Comment:	<p>EASA wording proposal: "Data connectivity with the installed equipment and other equipment which is:</p> <ul style="list-style-type: none"> <li>• required by the TCDS, AFM or POH,</li> <li>• required by other applicable requirements such as those for operations and airspace, or</li> <li>• mandated by the respective MEL, if this exists,</li> </ul> <p>is not allowed unless the equipment that is being installed is explicitly listed by its manufacturer as compatible equipment to which the other equipment can be connected." Does not address information security protection. The comment is raised assuming that the GNSS installation under discussion is part of threat scenario leading to failure conditions higher than minor.</p>	Rationale:	CS ETSO criteria for information security protection already address security assurance for ETSO articles.	Proposed text:	<p>is not allowed unless the GNSS equipment that is being installed is explicitly listed by its manufacturer as compatible equipment to which the other equipment can be connected</p> <p>Note: GNSS equipment manufacturer list address overall compatibility, digital communication interfaces and information security protection aspects.</p>
Paragraph No:	Standard Change CS-SC052d INSTALLATION OF GNSS EQUIPMENT / subparagraph 3 Acceptable methods, techniques and practices								
Comment:	<p>EASA wording proposal: "Data connectivity with the installed equipment and other equipment which is:</p> <ul style="list-style-type: none"> <li>• required by the TCDS, AFM or POH,</li> <li>• required by other applicable requirements such as those for operations and airspace, or</li> <li>• mandated by the respective MEL, if this exists,</li> </ul> <p>is not allowed unless the equipment that is being installed is explicitly listed by its manufacturer as compatible equipment to which the other equipment can be connected." Does not address information security protection. The comment is raised assuming that the GNSS installation under discussion is part of threat scenario leading to failure conditions higher than minor.</p>								
Rationale:	CS ETSO criteria for information security protection already address security assurance for ETSO articles.								
Proposed text:	<p>is not allowed unless the GNSS equipment that is being installed is explicitly listed by its manufacturer as compatible equipment to which the other equipment can be connected</p> <p>Note: GNSS equipment manufacturer list address overall compatibility, digital communication interfaces and information security protection aspects.</p>								
response	<p>Partially accepted</p> <p>Security protection is generally not included in ETSO'd GNSS. The original SC did not require an ETSO for the GNSS as this was for awareness only.</p> <p>The text has been adapted. Please, see also the replies to comments #60, #61, #62, #63 and #80.</p>								

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comment	<p>15 <span style="float: right;">comment by: Samionics / General Aviation Avionics</span></p> <p>An ADF connected to the AFCS? Please remove all text regarding autopilots in this section simply because ADF's are not connected to an autopilot.</p>
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	"This SC does not include installation of antennas."  Maybe it should beacuse an ADF antenna is quite large compared to other antennas.
response	Partially accepted  Accepted for the connection to the autopilot. There were no requirements for the installation of a large ADF antenna. The revision did not address these developments.
comment	250 <span style="float: right;">comment by: <i>FNAM</i></span>  <b>Position:</b> No comments: Neutral opinion.
response	Noted

**Standard Change CS-SC056b A1**

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comment	173 <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span>  This SC covers the exchange of VOR equipment that has been installed in the aircraft. We suggest to include the installation of VOR Equipment in this SC to allow new stand-alone installations.
response	Accepted  A location restriction has been added. If this restriction prohibits installation, a combined NAV/COM unit may be installed with SC006a.
comment	251 <span style="float: right;">comment by: <i>FNAM</i></span>  <b>Position:</b> No comments: Neutral opinion.  <b>Question:</b> Why this CS STAN is limited to VFR aircraft? In fact, for VFR or IFR aircraft, the equipment is the same and the installation and test procedures as well.
response	Partially accepted  Please, see the response to comment #13.

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comment	32 <span style="float: right;">comment by: <i>KSAK - Swedish Royal Aero Club</i></span>  We see no reason to not allow this as new equipment for IFR aircraft. It will increase flight safety! And it will be done by a professional.
response	Partially accepted



The community expresses considerably different positions regarding extension to IFR for a new installation.

Please, see the responses to comments #94, #206, #300 and #316.

This SC proposes a compromise by enabling the replacement of an existing EC function or a device for IFR-certified aircraft.

comment 64 comment by: *Garmin International*

**CS-SC057a Page 68:**

In the second paragraph of section 3, the term “embedded GPS” is used. This is inconsistent with the use of “GNSS receiver” in other sections of the document. Suggest replacing “embedded GPS” with “embedded GNSS receiver”.

response Accepted

The proposed text has been inserted.

Thank you

comment 65 comment by: *Garmin International*

**CS-SC057a Page 72:**

In the “Related declarations/conditions” entry for the Receiver element, a note is included “UAT is not intended to be operated in European airspace”. This note seems overly broad and does not acknowledge that national regulations apply and UAT may be operated in some Member States. We suggest updating the note to clarify: “UAT is not approved for unrestricted usage across the European Union. National regulations apply and UAT may be operated in some Member States”.

response Accepted

The correction has been introduced.

comment 66 comment by: *Garmin International*

**CS-SC057a Page 72:**

Regarding the Aircraft Position element, we note that it appears equipment allowed under CS-SC052d can support the Aircraft Position element of Electronic Conspicuity Function as defined in CS-SC057a.

We encourage the agency to allow CS-SC052 concurrently with CS-SC057a.

response Accepted

The text has been modified accordingly.

comment 67 comment by: *Garmin International*



	<p><b>CS-SC057a Page 72:</b></p> <p>In the “Related declarations/conditions” entry for the Display element, the first sentence states “The equipment manufacturer has provided a means (specific display or portable unit) to display the surrounding traffic”. The term "surrounding traffic" may imply that all surrounding traffic will be displayed. Traffic will only be displayed when that traffic is transmitting position on a frequency and in a format compatible with the Receiver element of the EC function.</p> <p>We suggest the term "surrounding traffic" be replaced with "traffic received by the EC function".</p>
response	<p>Accepted</p> <p>The proposed text has been used.</p> <p>Thank you</p>
comment	<p>68 <span style="float: right;">comment by: <i>Garmin International</i></span></p>
	<p><b>CS-SC057a Page 74:</b></p> <p>In Section 4, the maximum mass of the electronic conspicuity function or device is limited to 300g. This is quite low especially for a device powered by internal batteries. We note that PowerFlarm Portable is 260g without batteries. We recommend increasing the maximum mass to at least 500g or removing the mass limitation altogether.</p>
response	<p>Partially accepted</p> <p>For a mass slightly above 300 g, the following is introduced:</p> <p>‘The installer shall assess the compatibility of the mounting instructions from the equipment manufacturer with the characteristics of the intended mounting location.’</p>
comment	<p>93 <span style="float: right;">comment by: <i>DGAC France</i></span></p>
	<p>1 Purpose:</p> <p>It is understood that EC function will be implemented through installation of a new device in all case (which seems confirmed by CS-SC057a table’s content, the latter only dealing with equipments). As such, proposed wording "function or a device" is deemed as confusing and it is proposed to replace these mentions with "device" only while keeping the description of EC function in CS-SC057a.</p> <p>Why not also mentioning obstacles awareness as in the chapters 4-5 ?</p> <p>Should "another device" be understood as a device already integrated in the aircraft before EC function implementation?</p>
response	<p>Partially accepted</p>



Section 4 includes a statement equivalent to what is indicated in SC051() for FLARM: 'The use of an electronic conspicuity function or a device is limited to prompting an additional visual scan for traffic and/or obstacles displayed by the EC function.'  
The 'obstacle awareness only' has been added in Section 5.

comment 94 comment by: DGAC France

2 Applicability/Eligibility: "exchange of an existing electronic conspicuity function or a device on an IFR aircraft."

It is understood that existing EC installation on IFR aircraft have been implemented by aircraft owners without being certified. As such, it is not clear why these aircraft owners shall be the only IFR operators authorized to install EC function/device.

response Partially accepted

The initial installation on IFR-certified aircraft cannot be performed by this SC. Therefore, the initial installation is certified. This SC enables to exchange the existing elements of an installed EC function.

comment 95 comment by: DGAC France

Figure 1 : Did EASA assess the acceptability of the potential surge of EC equipments from a frequency occupation standpoint ?

response For 1090 MHz, aircraft broadcasting ADS-B OUT do not create more frequency congestion than aircraft already transmitting with a Mode S transponder. The 'extended squitter' format is capable of carrying much more data than the basic 'short squitter' Mode S version. There is no impact on the channel load compared to the Mode S transponder.

For frequencies that are outside the aeronautical frequencies, different conditions apply. Frequency congestion is always related to the number of transmissions (thus number of aircraft in an area). Frequency congestion also depends on the protocol and on the application. Most of these technologies use modern protocols that are more efficient than ADS-B (e.g. FANET in Skytraxx, P3i in PilotAware, FLARM, etc.).

Note: For P3i, please see [https://global-uploads.webflow.com/5d56c24810fbfdba08b488cd/5fce83cb59b87b89c2407997\\_Protocol.pdf](https://global-uploads.webflow.com/5d56c24810fbfdba08b488cd/5fce83cb59b87b89c2407997_Protocol.pdf)

If EC becomes popular, the congestion's risk on any frequency would increase. Using and coordinating different frequencies might actually contribute to a possible solution against frequency congestion. In this SC, enabling different frequency bands enables to rely on the ITU coordination. Interoperability between these devices within and outside the aeronautical frequency bands is the challenge.

comment 96 comment by: DGAC France

Page 72 - Receiver :

Can you give an example of an equivalent to an ETSO authorisation ? Does it include only TSO/JTSO or is it wider ?



response	<p>This is a general comment applicable through all the CS-STAN document.</p> <p>Page 72 - Display : Proposed wording does not address the requirements for the use/choice of colors on the display to avoid possible confusion with tasks' priorities and ensure consistency with cockpit alerts.</p> <p>About the instructions to install such a display, Why not specifying strength objectives for the display attachment/installation?</p> <p>Accepted</p> <p>For the first part of the comment (TSO/JTSO), please see the response to comment #101.</p> <p>For the display attachment/installation, please see the response to comment #105.</p>
comment	<p>97 <span style="float: right;">comment by: DGAC France</span></p> <p>4 - Limitations : <i>"The installed electronic conspicuity function or a device must not generate alerts that mask other alerts generated by other rotorcraft systems that need more immediate action."</i> As for FLARM, the chosen wording ("mask") is not deemed as clear enough.</p> <p><i>"The use of an electronic conspicuity function or a device is limited to prompting an additional visual scan for surrounding traffic <b>and/or obstacles</b>."</i> It is expected that systems providing such will information rely on the use of obstacles databases. It is suggested that EASA clarifies such databases shall be kept up-to-date by aircraft operators</p>
response	<p>Partially accepted</p> <p>Requirements similar to those in Sections 4 and 5 of CS-SC054() have been introduced.</p> <p>The word 'mask' has been replaced by 'override'.</p>
comment	<p>98 <span style="float: right;">comment by: DGAC France</span></p> <p>5 - Manuals It is not clear why this should apply to rotorcraft only</p>
response	<p>Partially accepted</p> <p>This SC is an extension from CS-SC051d that did not include these requirements. One requirement is described in the manual as 'airborne traffic awareness'. The other requirement has been added in order to address comment #96.</p>
comment	<p>131 <span style="float: right;">comment by: DGAC France</span></p>

response	<p>Proposed CS-SC057a does not include minimum performance requirements (continuity, integrity ...) for the new EC function to be implemented, only equipment manufacturer declarations are required. Even if the aim of EC function is solely to provide pilots with traffic/obstacles awareness, the absence of performance requirements is not deemed as acceptable and specific criteria should be defined by EASA.</p> <p>Partially accepted</p> <p>The aim of EC is to enhance visual scanning. There is no guarantee that such an installation will correctly display all surrounding traffic in all conditions (e.g. aircraft manoeuvring, surrounding aircraft not electronically visible, etc.). This is equivalent to Configuration 3 of SC005b. In SC005b, the minimum requirements are needed to protect the usage of the 1090 MHz frequency and to properly code the performance parameters (to mitigate the risks for ATC services). For non-aeronautical frequencies, telecommunications regulations require compliance with specific standards. 'The equipment manufacturer shall declare how any such emitter used in the electronic conspicuity function or device complies with the applicable telecommunications regulations.'</p> <p>Thank you</p>
comment	<p>154 <span style="float: right;">comment by: <i>Europe Air Sports</i></span></p> <p>We question the wording "An aviation frequency is defined as a radio frequency from the aeronautical frequency spectrum (100 MHz– 100 GHz frequency range)." In fact the ITU Radio Regulations have allocated a very limited number of frequencies for civilian aeronautical use. The text can be misleadingly interpreted such that the whole range 100 MHz-100 GHz is allocated to aeronautical services.</p> <p>Suggestion: "An aviation frequency is defined as a radio frequency allocated to an aeronautical radio service in the ITU Radio Regulations within the frequency range 100 MHz-100 GHz".</p>
response	<p>Accepted</p> <p>Please see also the response to comment #229.</p> <p>Thank you</p>
comment	<p>155 <span style="float: right;">comment by: <i>Europe Air Sports</i></span></p> <p>Note that the text implies that devices which send the own position to a ground station, i.e. not as a broadcast receivable directly by other aircraft in range, are not included in the definition of electronic conspicuity devices. Is that the intention?</p>
response	<p>Partially accepted</p> <p>This was not the intent. The definition was functional and generic with an attempt to avoid referring to any technical or operational solution. This is clarified in Section 3.</p>
comment	<p>156 <span style="float: right;">comment by: <i>Europe Air Sports</i></span></p>



response	<p>According to the NPA, as proposed, the GNSS receiver needs to be (physically) included in the device. Please consider allowing that the EC device gets its position information from another onboard GNSS receiver (which may often be certified to a higher level, e.g. for IFR use) similar to the ADS-B arrangement with a position source connected to the Mode S transponder.</p> <p>Partially accepted</p> <p>Please see the response to comment #66.</p> <p>See also the limitation that has been introduced to address comment #157.</p>
comment	<p>157 <span style="float: right;">comment by: <i>Europe Air Sports</i></span></p> <p>Comment: "The outputs of the electronic conspicuity function or device must not be input to any other type of system." Suggestion: In our understanding, it is very helpful and a large safety benefit if other traffic "targets" are displayed overlaid on a moving map display.</p>
response	<p>Accepted</p> <p>The intent is to prevent connection to an AFCS or to a required system.</p>
comment	<p>201 <span style="float: right;">comment by: <i>EUROCONTROL</i></span></p> <p>Level High</p> <p>The concept of "ELECTRONIC CONSPICUITY (EC) FUNCTION" appears to be linked to SERA 6005 terminology for "manned aircraft to..."make themselves electronically conspicuous to the U-space service providers". Is it correctly understood that it is EASAs opinion that all and any of these unlimited set of proposed functions/solutions are sufficient, feasible and appropriate for manned aircraft to meet the SERA requirement and at the same time supporting the USSP needs and expectations.</p> <p>If this is not the intention the SC should be updated to make this very clear. It will be very confusing for an installer when a device sufficient to be the SERA e conspicuity requirement has been installed (or not)</p>
response	<p>Accepted</p> <p>The following note has been added to CS-SC057a:</p> <p>‘The installation of the EC function in accordance with this SC does not automatically ensure compliance with SERA.6005(c) that requires manned aircraft that operate as uncontrolled traffic in U-space to be electronically conspicuous to U-space service providers. Please refer to the AMC and GM to point SERA.6005(c) to obtain information about the acceptable methods.’</p>
comment	<p>202 <span style="float: right;">comment by: <i>EUROCONTROL</i></span></p>





	<p>Level Medium</p> <p>Does the CS cover/allow portable units? (cf SC005 which does not allow such by stating "The use of ADS-B portable units is not covered by CS-STAN.")</p> <p>To be clarified</p>
response	<p>Accepted</p> <p>All SCs cover equipment installation. SC005 explicitly stated that ADS-B portable units should raise awareness on issues potentially negatively impacting on ATS. Simultaneous ADS-B OUT transmissions from the same aircraft (e.g. installed and portable ADS-B OUT), if not specifically processed by the ground system, generally have a negative impact on ATS. A similar statement has been added.</p> <p>Thank you</p>
comment	<p>203 <span style="float: right;">comment by: <i>EUROCONTROL</i></span></p> <p>Level Low</p> <p>The text "FLARM® technology would qualify for this SC. However, this is already specifically covered in CS-SC051()." seems superfluous with the subsequent sentence.</p> <p>Remove the text "FLARM® technology would qualify for this SC. However, this is already specifically covered in CS-SC051()."</p>
response	<p>Accepted</p> <p>The sentence has been deleted.</p>
comment	<p>204 <span style="float: right;">comment by: <i>EUROCONTROL</i></span></p> <p>Level Low</p> <p>The text "For example, the installation of a device that emits outside the aviation frequency band, on another frequency than FLARM," seems to indicate that the frequency must be both outside aviation frequency and outside FLARM, i.e. it can not transmit on FLARM</p> <p>Verify intended meaning</p>
response	<p>Partially accepted</p> <p>The intent is to keep CS-SC051d for an FLARM emitter.</p>
comment	<p>205 <span style="float: right;">comment by: <i>EUROCONTROL</i></span></p> <p>Editorial</p>

response	<p>The following sentence is not clear at all "The installation of an electronic conspicuity function or a device, optionally, includes an integrated antenna and/or an external antenna with the conditions specified in this SC."</p> <p>To be clarified</p> <p>Accepted</p> <p>The sentence has been modified.</p>
comment	<p>206 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Level Low</p> <p>Section 2. The differentiation between VFR and IFR is not clear. VFR/IFR is per flight - while it seems to imply per aircraft? If it is per aircraft what is then the criteria to use Type Cert., CNS equipment, Maintenance or intended operations? If it is the TC then multiple aircraft are excluded even if they are only capable to operate VFR?</p> <p>To be clarified</p>
response	<p>Partially accepted</p> <p>This SC can be installed on any VFR eligible aircraft. Therefore, this SC applies to VFR installations. On the other hand, if an IFR-certified aircraft is already fitted with EC, then it is possible to exchange this previously installed EC. It is not possible to <u>install</u> EC by using this SC on an IFR eligible aircraft.</p> <p>Please, see also the reply to comment #300.</p>
comment	<p>207 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Editorial</p> <p>The meaning of the sentence "This SC covers the installations of equipment that are not already described in another specific SC." is unclear. Does it mean that it "only" covers such cases i.e. that the installer need to search if another case applies before this SC can be applied or is it information that this SC is unique?</p> <p>To be clarified</p>
response	<p>Partially accepted</p> <p>This sentence is used in other SCs, such as SC402b. The text has been changed accordingly.</p>
comment	<p>208 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Level Medium</p> <p>The full paragraph starting with "Transponder-based 1090.." especially the statement "1090 MHz is the only aviation frequency that is currently usable across</p>



	<p>the EU Member States for electronic conspicuity function or a devices." is not understood in the context and seems contradictory to the SC content...?</p> <p>Clarify the full SC scope and objective</p>
response	<p>Partially accepted</p> <p>ADS-B can be used as part of this SC. The text has been changed following comments #225 and #208.</p>
comment	<p>209 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Level High</p> <p>There is clearly an overlap between SC057 and SC005 for 1090 Transponding devices. While in SC005 the QIs are strictly controlled there is no information regarding QIs or versions in SC057. Similarly there is not control on QIs or versions for non-transponding devices as well as UAT devices. This causes a significant risk of misconfiguration.</p> <p>Entire SC057 should be reconsidered and revised.</p>
response	<p>Partially accepted</p> <p>When using the standard change process, CS-SC002() and CS-SC005 are the references for the element 'Emitter within the aeronautical frequency band for a transponder-based 1090-MHz ES transmitter'. Quality indicators are set accordingly. When using the standard certification process, quality indicators shall also be set to the appropriate values.</p> <p>1090-MHz NTDs fall under Member States' regulations.</p> <p>978-MHz UAT emitters fall under Member States' regulations.</p> <p>1090-MHz NTDs and 978-MHz UAT emitters are generally prohibited, unless specifically authorised by Member States. The assumption is that if Member States authorise these emitters, they also define the appropriate requirements and conditions.</p>
comment	<p>210 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Editorial</p> <p>The part "and UAT devices" is superfluous given the foregoing sentence and it is misleading since it is not 1090.</p> <p>To be removed</p>
response	<p>Partially accepted</p> <p>Please, see also reply to comment #208.</p> <p>The situation is not straightforward for users in the Single Sky Area. Airborne equipment is generally capable of using both 1090 and 978 MHz. Some Member</p>

States might authorise the usage of 978 MHz. However, a neighbouring Member State might not.

Please, see the responses to comment #225.

comment

211

comment by: EUROCONTROL

Level Medium

The text "An electronic conspicuity function or device comprises at least the following elements: a position sensor for the aircraft position, a transmitting function (transmitter with antenna), a receiver, and a means to display nearby traffic." and the figure below defines an electronic conspicuity function or device to at minimum include receiver and display in the same device, which seems to prevent only implementing the transmit part as well as implementing the transmit and receive parts separately. The following text also seems to go in this direction "The outputs of the electronic conspicuity function or device must not be input to any other type of system." Are these parts also envisaged to be minimum per the eConspicuity AMC? Why are distributed systems prevented and why are not transmit only systems acceptable? (it would satisfy SERA)

To be clarified

response

Partially accepted

The text has been changed to clarify some aspects. The figure is a logical illustration of the components. The limitation for the outputs of the EC has been clarified: no connection to an AFCS or to a required system (please, see also the reply to comment #157).

EC can be a distributed system. This is reflected in the sentence 'The installer can only install parts included in the electronic conspicuity function or a device ....'

For SERA, please refer to the reply for comment #201.

comment

212

comment by: EUROCONTROL

Level Medium

The element "Emitter outside the aviation frequency band" should be clarified. Is it intended to also include SRDs?

To be clarified

response

Partially accepted

SRDs are included (see Note 1 and Note 2).

comment

213

comment by: EUROCONTROL

Level Medium



response	<p>SC057 included conditions on states national regulations and only use in national airspace. (e.g. such elements require a radio licence in accordance with national regulations, even if they comply with ETSO-C166() or equivalent;) and 3 (they are only usable in national airspace.)</p> <p>Is it appropriate to have local solutions in CS-STAN?</p> <p>To be clarified</p> <p>Partially accepted</p> <p>Such installations will be under the responsibility of Member States. Local solutions that do not create issues to the global community are acceptable. It is important to inform the community regarding the usage of ETSO equipment.</p> <p>Please, see also the reply to comment #214.</p>
comment	<p>214 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Level Low</p> <p>The interpretation of the text "the receiver holds an ETSO authorisation, or equivalent;" is not clear in relation to the note which states: "Note: Receivers that do not hold an ETSO authorisation, or equivalent, can be installed without an EASA Form 1."</p> <p>To be clarified</p>
response	<p>Partially accepted</p> <p>The 'whether' indicates the possibilities described below. An EASA Form 1 is not needed for a receiver outside the aeronautical frequency band. This SC intends to have the manufacturer resuming the responsibility to inform the installers for local solutions. This also makes it possible to implement different requirements for local solutions that are not covered by the European regulatory system.</p>
comment	<p>215 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Level Medium</p> <p>Receivers only refer to UAT. Seems that ETSO-195() is missing?</p> <p>Add ETSO-195() or clarify why only UAT material is included</p>
response	<p>Partially accepted</p> <p>UAT is considered because of trials for UAT weather and traffic as indicated in the note.</p> <p>This SC is indeed focused on non-ETSO-C195 displays. The introduction of ETSO C195 would have required additional work. This task is not simple (see e.g. A Report from the ADS-B In ARC to the FAA, <a href="https://www.aopa.org/">https://www.aopa.org/</a>-</p>

/media/Files/AOPA/Home/News/All-News/2011/November/To-buy-or-not-to-buy-ADS-B-In-group-says-let-pilots-choose/111117ADSB\_In\_ARC\_Report\_FINAL.pdf).

Such a task would require a concept of operations for the Single European Sky for the use of ADS-B IN applications. No other comment suggests such an interest. This work could be performed in a subsequent issue of CS-STAN in the future.

comment 216 comment by: EUROCONTROL

Level Medium

The requirement "The installed electronic conspicuity function or a device must not generate alerts that mask other alerts generated by other rotorcraft systems that need more immediate action." should be generalised to all aircraft

To be generalised

response Partially accepted

The limitation in Section 4 (must no generate alerts that ...) and the indications in Section 5 achieve the same goal.

Please, see also the reply to comment #97.

comment 217 comment by: EUROCONTROL

Level Medium

For an IFR aircraft, - is this referring to the aircraft or the operation. (If it is per aircraft what is then the criteria to use Type Cert., CNS equipment, Maintenance or intended operations? If it is the TC then multiple aircraft are excluded even if they are only capable to operate VFR?)

response Partially accepted

Please, see the response to comment #206.

comment 218 comment by: EUROCONTROL

Editorial

Section 5: The text "The following limitations apply to rotorcraft only:" and related two sub-bullets is duplicated with the limitations section and placed incorrectly in section 5.

To b removed

response Accepted

Duplicated text has been removed.

Thank you



comment	<p data-bbox="368 235 432 271">225</p> <p data-bbox="1059 235 1394 271" style="text-align: right;">comment by: <i>DGAC France</i></p> <p data-bbox="368 293 480 329">Page 67</p> <p data-bbox="368 360 1394 831"> <u>We suggest the following change:</u> “Transponder-based 1090 MHz extended squitter ADS-B transmitters are the only devices within the aviation frequency band for which the technical conditions to obtain a radio licence are harmonised across the EU Member States. This harmonisation excludes 1090 MHz non-transponder devices (NTDs) and UAT devices. <del>1090 MHz is the only aviation frequency that is currently usable across the EU Member States for electronic conspicuity function or a devices.</del> The 978 MHz frequency for UAT emitters, although used for electronic conspicuity function or a devices in other continents such as in the USA, is currently not standardised in the European Union. ETSO-C157b states that ‘UAT is not intended to be used in European Airspace’. This means that the usage conditions for 978 MHz <b>and for NTDs at 1090 MHz</b> are specific to each Member State, <b>and that such usage may be prohibited.</b> <del>Some Member States can completely prohibit the usage of 978 MHz for electronic conspicuity function or a devices.”</del> </p> <p data-bbox="368 853 1394 1055"> <u>Rationale:</u> this paragraph brings a lot of confusion (and in particular the underlined sentence) and is not in line with the following table since 1090 MHz is only for “approved aeronautical devices” at EU and international level. It is not an open frequency, and in France its access is regulated in accordance with ITU regulation and IACO standards applies.         </p>
response	<p data-bbox="368 1055 496 1090">Accepted</p> <p data-bbox="368 1113 863 1149">The text has been modified accordingly.</p>
comment	<p data-bbox="368 1211 432 1247">226</p> <p data-bbox="1059 1211 1394 1247" style="text-align: right;">comment by: <i>DGAC France</i></p> <p data-bbox="368 1270 480 1305">Page 68:</p> <p data-bbox="368 1328 1394 1529">           We suggest the following modification: “Note: An <del>aviation</del> <b>aeronautical</b> frequency is defined as a radio frequency <del>allocated to from the aeronautical services in accordance with telecommunication regulations</del> <b>allocated to from the aeronautical services in accordance with telecommunication regulations</b> frequency spectrum (100 MHz–100 GHz <del>frequency range</del>). Technical standards for the use of such frequencies include both the telecommunications and the aviation requirements.”         </p> <p data-bbox="368 1552 1394 1709">           Rationale: Aeronautical services exist under 100 MHz, and the ITU regulation has a much broader range of frequencies. Moreover, the previous sentence could be confusing regarding the aeronautical frequency spectrum (all frequencies between 100MHz – 100 GHz ?!).         </p> <p data-bbox="368 1709 1394 1776">           “Aeronautical frequency” instead of “aviation frequency” would be more coherent with telecommunication regulations (to be modified in all the CS-STAN).         </p>
response	<p data-bbox="368 1798 496 1834">Accepted</p> <p data-bbox="368 1856 863 1892">The text has been changed accordingly.</p> <p data-bbox="368 1915 512 1951">Thank you</p>

comment

233

comment by: *FLARM Technology*

The NPA proposes a totally new SC to cover the installation of a generic, unspecified “EC” device or function. Unlike e.g. CS-SC403 (installation of cameras), where the installed equipment is not used in any operating or safety capacity, the purpose of EC is, presumably, flight safety in a broader sense (situation awareness to decrease the risk of mid-air collisions). The risks with the installation are thus not only pertinent to structural and electrical provisions but also to human factors (e.g. pilot/system interface). Even if considering the Net Safety Benefit, it must be clear that the benefits outweigh the risks. However, no risk assessment has been conducted and the proposed SC leaves many questions (and potential risks) unanswered.

EASA has published a study (Speijker et al., 2012) concluding that “Options to mitigate See and Avoid limitations include [...] anti-collision devices on General Aviation aircraft”, “aural warnings are critical to make sure that the pilot is not distracted from his primary task for Collision Avoidance”, and “A standard developed by the industry [...] need to be encouraged”. Specifically, the section *Summary of results and outcomes* states that “The main candidate solutions are the cooperative and active systems FLARM/PowerFLARM (and derivatives) and the cooperative and passive Traffic Collision Avoidance Device (TCAD) systems”.

Several other studies have also been published with similar results. Many of these deal with alerted vs. unalerted visual acquisition and come to similar conclusions regarding the importance of alerts. Hobbs (1991) concluded that “The see-and-avoid principle in the absence of traffic alerts is subject to serious limitations”. Andrews (1984) concluded that “Under nominal search conditions, a TCAS II traffic advisory can increase the instantaneous rate of visual acquisition by an order of magnitude or more over the rate existing without an alert”. Andrews (1977) concluded that “Increasing [Pilot Warning Instruments] warning times beyond 40-60 seconds to collision has little effect upon the ultimate probability of acquisition”. Morris (2005) concluded that “the see-and-avoid concept misleads pilots and controllers by encouraging overconfidence in visual scanning [...] Potential mitigation strategies include [...] affordable and reliable collision avoidance technologies in all general aviation aircraft”.

The proposed SC doesn’t specify anything about the displaying of traffic or the generation of alerts other than that the equipment must “display the surrounding traffic”. This is, however, not supported by the scientific consensus, which highlights short-term tactical alerts for traffic that constitute a collision risk. There are, to our knowledge, no studies that recommend the use of aircraft displayed on a moving map as a mitigation strategy (this is how most EC systems present traffic). Even if some EC systems have a beep or similar when an aircraft comes within range, the screen (often a tablet — portable or sometimes mounted in front of the instrument panel) is frequently cluttered with a mix of other aircraft, airspace, and geographic map data. There is a substantial risk that this will only increase the heads-down time and create a distraction at the exact moment when it is critical to look for traffic.

Furthermore, the lack of specification of the physical layer, radio protocol, data semantics, and behavior layer risks creating a situation with a plethora of different EC systems where, even in the limited cases where they can receive each other, the





semantic disparity may cause additional risks. For example, one system may compare its barometric altitude with the GNSS altitude of another system, without accounting for the differences. Since many competing EC systems may be expected to be used under this SC, special consideration should be put into ensuring interoperability of these systems, preferably through onboard integration. The SC currently only specifies the transmission of the position, which will not be sufficient for interoperability. Namely, we recommend adding at least the following details:

- A unique identification of the sender, preferably the ICAO aircraft address, for matching transmissions from different systems, including ADS-B Out
- Vector data, i.e. velocity/track/climb rate, perhaps turn rate
- A minimum transmit rate
- An indication of integrity and accuracy of the position measurements, analogous to SIL/SDA/NICx
- A timing reference, either explicit (i.e. a time stamp) or implicit from the protocol timing

The proposed SC risks giving credibility to installations that might actually decrease safety, undermine system interoperability, and open the Pandora's box to all kinds of residual risks. Considering the stated risks, the fact that the proposed SC cannot be considered to "address miscellaneous issues of non-controversial nature" (Article 3(5) of EASA MB Decision No 18-2015, thus requiring an impact assessment), and the fact that no risk assessment has been conducted (Article 6(2), point (j) of EASA MB Decision No 18-2015), the proposed SC should be withdrawn until risk and impact assessments have been conducted.

#### References

Andrews, J. W. (1977). *Air-to-Air Visual Acquisition Performance with Pilot Warning Instruments (PWI)*. Lincoln Laboratory, Massachusetts Institute of Technology.

Andrews, J. W. (1984). *Air-to-air visual acquisition performance with TCAS II*. Lincoln Laboratory, Massachusetts Institute of Technology.

Hobbs, A. (1991). *Limitations of the see-and-avoid principle*. Australian Transport Safety Bureau.

Morris, C. C. (2005). *Midair collisions: Limitations of the see-and-avoid concept in civil aviation*. *Aviation, space, and environmental medicine*, 76(4), 357-365.

Speijker, L., Verstraeten, J., Kranenburg, C., & van der Geest, P. (2012). *Scoping improvements to 'See and Avoid' for General Aviation*. European Aviation Safety Agency.

response

Partially accepted

A theoretical risk–benefit assessment was conducted for all awareness functions to illustrate common-sense observations.



Background-safety-benefit-awareness-syst



SDT methods for aircraft certification.p

More specifically, multiple studies highlight the shortcomings of visual scanning. Indeed, human factors play an important role in the effectiveness of EC. Knowledge from the pilot of the specific EC and its limitations is also critical.

TCAS algorithm is public. 'ONERA has patented the principle of a low-cost device that significantly secures recreational aviation. The company Flarm Technology GmbH has developed the technology under license from Onera' (<https://www.onera.fr/en/news/the-aircraft-collision-avoidance-system-flarm-patented-by-onera-has-become-mandatory-for>).

There is no rationale to make this patent 'the technical design' or to wait for the development of an open technical standard or design while pilots continue losing their lives in mid-air collisions. The aim of the approach in this SC enables to generate creativity to develop solutions. Some will be good. Some will be bad. The market can be used to eliminate the bad solutions.

comment 252 comment by: *FNAM*

**Position:** No comments: Neutral opinion.

response Noted

comment 293 comment by: *European Sailplane Manufacturers*

In SC057 and others many information is made to differentiate the situation for emitters to be within or outside the "aviation frequency range".

It is certainly a challenge to fast and easily identify whether an emitter is within or outside or even to specify, which range is legally usable or not.

We cannot say whether all explanations given at the different locations in the proposed CS-STAN texts are all correct but perhaps it would be easier to include somewhere a good reference were the installer / the operator of such systems could find, which frequencies are legal to use?

A regarding EASA-wide reference table (perhaps somewhere on the EASA web pages) would be a real benefit for the aviation community and in the end even a safety benefit to prevent people from spamming / jamming frequencies which should be protected...?

response Partially accepted


The complexity is acknowledged. Indications in CS-STAN aim to address the issue. However, these guidelines might not be sufficient to decide whether a transmitter can be used without having access to the manuals and/or markings.

Within the scope of CS-STAN:

- emitters in the aeronautical frequency bands shall be ETSO authorised, or equivalent; such emitters shall also have a radio licence;
- emitters outside the aeronautical frequency bands shall comply with the applicable telecommunications regulations.



A note has been added in CS-STAN with links to the European Communications Office (<https://efis.cept.org/>). For example, this site enables to search all the frequencies allocated to aeronautical applications in Europe (ECA).



EFIS Application comparison 0.000 -

Information related to the harmonised European standards can be found in the ECO documentation database (<https://docdb.cept.org/>).

comment **294** comment by: *European Sailplane Manufacturers*

The requirement on page 74 that "The outputs of the electronic conspicuity function or device must not be input to any other type of system." should not be made.

Why?

Because within already existing and well used Flarm installations, such outputs (of Flarm) are already established (e.g. as additional info on a moving map display used for navigation).

It is understood that this poses no danger as such navigation displays are non-critical in a sailplane because the pilot does only VFR navigation were in theory all required is a paper-based aeronautical map and to look out of the cockpit.

But nevertheless using such output (in this case from Flarm) as input for another system shows already that such technology is possible, safe to use and useful.

response Accepted

Please, see the response to similar comments in #157 and in #211.

comment **300** comment by: *Malte HOELTKEN*

We fully support the possibility of installation of electronic conspicuity functions. We think the installation of EC function should be permissible into IFR aircraft, too. Especially when descending through clouds, different types of aviation meet and safety can drastically improve if the IFR pilot is made aware of other airspace users and vice versa.


response Partially accepted

This SC enables the exchange for IFR-certified aircraft. There are other diverse comments (#32, #94, #206 and #316) on this topic.

comment **316** comment by: *Airbus Helicopters*

Paragraph No:	Standard Change CS-SC057a INSTALLATION OF AN ELECTRONIC CONSPICUITY (EC) FUNCTION / general comment
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Comment:	EASA wording proposal to include EC functional implementation in IFR aircraft is premature. Following sentences need special attention. -exchange of an existing electronic conspicuity function or a device on an IFR aircraft. - For an IFR aircraft, a display installed as part of this SC can only replace an existing display that is not required for the specific operation
Rationale:	The functional implementation of EC involves extensive compatibility investigations, beyond the technical resources foreseen for SC. Aircraft tolerance of non ICAO frequencies / devices is usually addressed within Certification Review Items.
Proposed text:	Discussion on EC implementation on IFR aircraft may be continued within an EASA working group.
response	<p>Partially accepted</p> <p>This is only for a replacement, not for a new installation. EC can transmit outside the aeronautical frequency bands. When the EC transmits within the aeronautical frequency bands, then this is covered by the installation of ADS-B OUT. There are other diverse comments (#32, #94, #206 and #300) on this topic. Comments represent different opinions. This SC mitigates the residual risks. The operational benefit outweighs the residual risks. This comes from the fact that EC aims to enhance visual scanning and not to replace it.</p> <div style="text-align: center;">  <p>Background-safety-benefit-awareness-syst</p> </div>

**Standard Change CS-SC059a** p. 76

comment	<p>16 <span style="float: right;">comment by: <i>Samionics / General Aviation Avionics</i></span></p> <p>Installation of a mechanical directional gyro (vac or electrical). Most if not all already have a directional gyro installed. In case the gyro needs to be replaced for another type we use CS-SC401c.</p> <p>CS-SC059a do we need it?</p>
response	<p>Noted</p> <p>It is correct that in most cases a SC would be needed for a replacement, which is CS-SC401d; however, this is kept for the first-time installation of a directional gyro.</p>
comment	<p>44 <span style="float: right;">comment by: <i>CAA CZ</i></span></p>

	<p>Purpose: The (proposed wording) SC scope should be described as „This SC is for the new installation of a <u>magnetic or non-magnetic</u> gyroscopically stabilised direction indicator.“</p>
response	<p>Accepted</p> <p>The text has been changed for clarity.</p>
comment	<p>99 <span style="float: right;">comment by: <i>DGAC France</i></span></p> <p>3 - Acceptable methods, techniques, and practices  <i>"The instrument is compatible with the connections to the existing flight management/navigation systems."</i></p> <p>Is it relevant to mention a Flight Management System if the requirement is only applicable to VFR aircraft ?</p>
response	<p>Noted</p> <p>The introduction of glass cockpit, also in VFR-certified aircraft, often brings FMS into those aircraft. Therefore, the condition has been kept.</p>
comment	<p>158 <span style="float: right;">comment by: <i>Europe Air Sports</i></span></p> <p>Please see the comment to CS-SC006a.</p>
response	<p>Not accepted</p> <p>The criticality of the installation in an IFR-certified rotorcraft is beyond the scope of a simple installation following a standard change (please, see also the response to comment #301 below).</p>
comment	<p>253 <span style="float: right;">comment by: <i>FNAM</i></span></p> <p><b>Position:</b> No comments: Neutral opinion.  <b>Question:</b> §1 Why indicate the word "New"?</p>
response	<p>Noted</p> <p>The word 'new' is used since the replacement of existing indicators is covered by CS-SC401d.</p>
comment	<p>301 <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span></p> <p>We suggest to include VFR night and IFR operated aircraft into this SC. The principles outlines in item 3 already mandate tests to show suitability for both operations.</p> <p>Furthermore, we suggest to remove the authorisation requirement according to ETSO-C5f and ETSO-C6e and replace it with a a declaration of compliance to these standards for installations where the stabilised direction indicator is not mandated by regulation or minimum equipment specifications.</p>

response

Not accepted

For IFR-certified rotorcraft, according to CS-27 and CS-29 Appendix B, VIII (a)(1), a magnetic gyro-stabilised direction indicator is already a required instrument, instead of the gyroscopic direction indicator required by CS 29.1303(h). According to point (4)(ii) in Appendix A to GM 21.A.91, the criticality of a failure of the installation in this case could require a major change classification.

Secondly, the ETSOA is the assurance of the minimum performance of the equipment. All other things equal, the fact that the equipment is not required does not minimise the consequence in case of erroneous indication due to insufficient performance.

Standard Change CS-SC060a

p. 78

comment

9

comment by: *Samionics / General Aviation Avionics*

"An installation check flight is conducted to assess whether the performance of the secondary attitude indicator is adequate"

Why is a check flight necessary when installing an attitude indicator?

The unit itself is approved TSO/ETSO and either designed for the panel tilt or has internal electronic panel tilt compensation (digital attitude indicator).

Makes more sense when installing or replacing antennas that are located in areas where their performance may be affected.

"The secondary attitude indicator must be similar in form, fit and mass to the unit that it replaces"

If there is a free hole in the instrument panel - then we cant install a new attitude indicator because it doesnt replace anything?

"If the secondary attitude indicator is not exclusively powered by internal batteries, the following conditions apply"

May the attitude indicator be vac driven? If its an electrical attitude indicator it will always be powered by the aircraft's electrical system, there are no such indicators that are exclusively powered by internal batteries except in emergency mode.

Why make installation of a second attitude indicator more complicated than exchange of an existing for a new type iaw CS-SC401c that even allows the installation of a digital attitude indicator - "This SC does not permit the installation of digital multifunction displays. However, a combination of turn and slip with bank and pitch in one display is acceptable."

response

Partially accepted

The check flight for proper functioning is not a test flight. It validates the installation after the calibration, configuration, and ground tests of the unit. A check flight is even



more relevant with the addition of the reply to comment #303. Some additional parameters, like airspeed, generally need a minimum value to be displayed.

The text has been changed to indicate that an empty slot can be used.

It seems more flexible to allow units with batteries.

The SC has been changed in order to enable additional parameters (please, see the response to comment #303).

comment 33 comment by: KSAK - Swedish Royal Aero Club

We see no reason to not allow this as new equipment for IFR aircraft. It will increase flight safety! And it will be done by a professional.

response Partially accepted

More substantiation and/or requirements would be needed to support the case for IFR-certified aircraft.

comment 45 comment by: CAA CZ

1) 1) Acceptable methods: Delete excessive text in „— If a non-essential supply (bus bar) exists, the secondary attitude indicator is powered from this bus. secondary attitude indicator secondary attitude indicator“

2) 2) Acceptable methods: The requirement “... the equipment manufacturer has declared that the equipment is suitable for the specific aircraft type and intended operation” will be difficult to comply with. Please explain the term “specific aircraft type”.

3) Limitations: Explanation of the difference between a secondary attitude indicator and a standby attitude indicator would be helpful guidance to a GA user to make no mistake while using this SC.

response Partially accepted.

1) Corrected. Thank you.

2) Some responsibility shall be assumed by the equipment manufacturer. It has been reworded to ‘aircraft type’. A condition has been added for the installer, following comment #102. Thank you.

3) There is an attempt to define the usage in the note in the purpose section.

comment 100 comment by: DGAC France

2 - Applicability/Eligibility :

Rewording proposal to clarify VFR/IFR conditions requirements apply to both aeroplanes and ELA2 aircraft:

"- the following aircraft certified to operate only in VFR conditions (including VFR at night): aeroplanes that are not complex motor-powered aircraft and ELA2 aircraft;  
- the following aircraft certified to operate only in IFR conditions provided that one



	of the following cases applies: aeroplanes that are not complex motor-powered aircraft and ELA2 aircraft; - an exchange ..."
response	<p>Partially accepted</p> <p>The different requirements are based on a risk–benefit assessment. Installation is voluntary and this is a secondary attitude indicator. FAA AC91-75 explains the risks related to vacuum systems or gyro failures, and, in particular, the insidious failures making such failures difficult to recognise. This secondary unit is used to cross-check information with the primary unit or to enable safe landing in case of failure of the primary unit. The minimum performance ensured through equipment ETSO authorisation mitigates the risk of misleading information (worst case). The exposure risk is also minimised: during cross-check, or for landing in case of failure of the primary attitude unit. As regards benefit, a secondary attitude indicator might contribute to reduce loss-of-control events: detection of errors from the primary attitude indicator by comparison and different HMI of a modern instrument.</p>
comment	<p>101 <span style="float: right;">comment by: DGAC France</span></p> <p>3 - Acceptable methods, techniques, and practices <i>"The secondary attitude indicator meets ETSO-C4c and ETSO-C113, or later amendments, or their equivalent."</i></p> <p>Could it be clarified (US TSOs)?</p>
response	<p>Partially accepted</p> <p>This equivalence includes FAA TSOs but is extended to other authorisations from other regulatory authorities, accepted through bilateral agreements between the EU and the respective third countries.</p>
comment	<p>102 <span style="float: right;">comment by: DGAC France</span></p> <p>3. Acceptable methods, techniques, and practices <i>"For substitution of a rate-of-turn indicator, all the additional conditions from FAA AC 91-75 apply. Moreover, the equipment manufacturer has declared that the equipment is suitable for the specific aircraft type and intended operation."</i></p> <p>This kind of declaration may not be sufficient considering the potential aircraft post-delivery modifications (STCs ...)equipment manufacturers may not be necessarily be aware of.</p>
response	<p>Accepted</p> <p>The additional condition is for the installer.</p> <p>Thank you</p>
comment	<p>103 <span style="float: right;">comment by: DGAC France</span></p>



	4 Limitations : AFCS system instead of autopilot?
response	Accepted  The change has been made accordingly.
comment	118 <span style="float: right;">comment by: DGAC France</span>  At the bottom of page 78, some words in a foreign language.
response	Partially accepted  Not sure the comment is understood correctly.  The word 'wristwatch' is used in AMC1 SAO.IDE.105(a)(2) in the AMC and GM to Part-SAO ( <a href="#">Annex II to EDD 2019-001-R</a> ). This word is also used in the <a href="#">corrigendum</a> to the Certification Specifications Generic Master Minimum Equipment List – Comment-Response Document 2012-09.  In AMC1 NCO.IDE.A.120(a)(2) and NCO.IDE.A.125(a)(2), this is spelt as 'wrist watch', in two separate words.
comment	159 <span style="float: right;">comment by: Europe Air Sports</span>  Please see the comment to CS-SC006a.
response	Partially accepted  This SC introduces some possibilities for IFR-certified aircraft. The risk–benefit approach is explained following comment #100. Additional arguments and/or requirements would be needed for a new IFR installation, or even a conversion from VFR to IFR.
comment	254 <span style="float: right;">comment by: FNAM</span>  <b>Position:</b> §4: Why is this SC only limited to aircraft performing non-commercial flights? Unfavorable opinion on this point. No further comments.
response	Partially accepted  Please, see the responses to comments #100, #159, #302 and #303.
comment	302 <span style="float: right;">comment by: Malte HOELTKEN</span>  We suggest to extend this SC to the installation of primary attitude indicators for aircraft, where the attitude indicator is not mandated by operation or certification.
response	Accepted  The text has been modified.  The term 'primary' is not used.

	Thank you	
comment	303	comment by: <i>Malte HOELTKEN</i>
	We suggest to clarify that the secondary attitude indicator may include further secondary instruments, e.g. direction indication, airspeed, altitude, turn rate, as these functions often come within one avionic item (e.g. Garmin G5)	
response	Accepted The text has been modified.	

<b>Standard Change CS-SC061a</b>	p. 80
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comment	46	comment by: <i>CAA CZ</i>
	<p>1) 1) A limitation of the transmitted performance of equipment is missing.</p> <p>2) 2) How to demonstrate the GSM module regarding its various frequencies?</p> <p>3) Is this SC applicable on the aircraft having their engine controlled by ECU/FADEC? It can be EMI/EMC issue. Is a non-DOA organisation eligible to propose a correct procedure for the EMI/EMC verification?</p>	
response	<p>Partially accepted</p> <p>Some of the text has been corrected.</p> <p>Additionally, for 1), compliance with the applicable telecommunications regulations includes limitation of the transmitted performance and additional requirements.</p> <p>For 2), any transmitter shall demonstrate compliance with the applicable telecommunications regulations.</p> <p>For 3), the risk of interference is mitigated by the qualification of the ECU/FADEC, the telecommunications requirements for the emitter, the 'location away from a required aircraft instrument', and a ground check. The pilot may carry portable transmitters that emit outside the aeronautical frequency bands. Any known limitation for the ECU/FADEC shall be documented. A generic limitation has been added. This limitation is included in other SCs too.</p>	

comment	69	comment by: <i>Garmin International</i>
	<p><b>CS-SC061a Page 80:</b></p> <p>In the second paragraph of section 3, the terms "a GPS" and "a GPS antenna" are used. This is inconsistent with the use of "GNSS receiver" in other sections of the document. Suggest replacing these terms with "a GNSS receiver" and "a GNSS antenna", respectively.</p>	
response	<p>Accepted</p> <p>Thank you</p>	



comment	<p>104 <span style="float: right;">comment by: DGAC France</span></p> <p>3. Acceptable methods, techniques, and practices  <i>"The equipment manufacturer has declared how the risks associated with internal lithium batteries, if any, were considered. Refer to CS STAN.47 in Subpart A for ."</i></p> <p>Considering the intent of tracking systems, shouldn't it be a requirement that they have their own internal power source (or be powered by a power source different from the main aircraft power source)?</p> <p>The end of the phrase is missing : "for additional guidance"?</p> <p>The same with " <i>The equipment manufacturer has declared how flammability protection was considered. Refer to CS STAN.45 in Subpart A for..... . "</i></p>
response	<p>Accepted</p> <p>Thank you</p>

comment	<p>219 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Level Low</p> <p>What is the rationale for this "Example: For instance, if an aircraft is fitted with a GNSS unit installed with CS-SC005() in configuration 1 or 2, such a GNSS unit cannot be used to provide position information for the aircraft tracking system. However, there is no restriction on re-using the GNSS unit installed with CS-SC005() in configuration 3 for the aircraft tracking system, since this GNSS unit is neither approved nor required." It appears as a tracking system must use non-approved GNSS?</p> <p>To be clarified</p>
response	<p>Partially accepted</p> <p>The issue is related to the connection between ETSO-certified units and this uncertified unit. See also 'data bus connectivity' that aims to eliminate any risk of degradation of the GNSS receiver. The quality parameters in CS-SC005() depend on the certified GNSS source.</p>

comment	<p>220 <span style="float: right;">comment by: EUROCONTROL</span></p> <p>Level Medium</p> <p>Given the text "Any transmitter used in this SC must not transmit in the aeronautical frequency band (100 MHz–100 GHz frequency range)." it is confusing to see GSM listed as an alternative</p> <p>To be clarified</p>
response	<p>Accepted</p>



The text has been amended. Please, see also the reply to comment #229.

comment

227

comment by: DGAC France

Considering the comment#226 on CS-SC057a, we suggest the following changes:

Page 81 : “Any transmitter used in this SC must not transmit **within the aeronautical frequency bands (meaning on frequencies allocated to aeronautical services in accordance with telecommunication regulations)** ~~in the aeronautical frequency band (100 MHz–100 GHz frequency range)~~. Additionally, any such transmitter must comply with the applicable telecommunications regulations. The operating manual shall indicate any restrictions on the usage of the related frequencies as applicable to a specific country or continent. The aircraft tracking system can integrate a receiver within or outside the aviation frequency band.”

Page 83 : “The awareness function or awareness device does not emit within the **aeronautical aviation frequency bands (meaning on frequencies allocated to aeronautical services in accordance with telecommunication regulations)**. However, it can emit outside the aviation frequency band. Installations of an emitter within the aviation frequency band can be performed with other SCs or other means.”

Page 84 : “Any optional transmitter used in the awareness function or awareness device must not emit within the **aeronautical aviation frequency bands (meaning on frequencies allocated to aeronautical services in accordance with telecommunication regulations)** ~~(100 MHz–100 GHz)~~. It must comply with the applicable telecommunications regulations. The operating manual shall indicate any restrictions in the usage of related frequencies as applicable to a specific country or continent. Such a transmitter is eligible for installation without an EASA Form 1.

response

Accepted

The proposed text has been added.

Thank you

comment

255

comment by: FNAME

**Position:** §3 The example given by the GSM is not relevant because it can create electromagnetic problems with the systems on board the aircraft: Unfavorable opinion.

response

Partially accepted

Please, see the response to comment #256 and the corrections related to comment #227.

comment

317

comment by: Airbus Helicopters




Paragraph No:	Standard Change CS-SC061a INSTALLATION OF AN AIRCRAFT TRACKING SYSTEM / subparagraph 3 Acceptable methods, techniques and practices
Comment:	EASA wording proposal” A typical aircraft tracking system may include an electronic unit, a GPS, a GPS antenna, and a specific non-aviation antenna/receiver/transmitter (e.g. GSM).” May be improved to address GNSS instead of GPS.
Rationale:	GNSS encompass GPS, Galileo, GLONASS, and other air navigation satellite systems.
Proposed text:	A typical aircraft tracking system may include an electronic unit, a <b>GNSS GPS</b> , a <b>GNSS GPS</b> antenna, and a specific non-aviation antenna/receiver/transmitter (e.g. GSM)
response	Accepted Please, see also the reply to comment #69. Thank you

**Standard Change CS-SC062a**

p. 83

comment	34 comment by: <i>KSAK - Swedish Royal Aero Club</i>
	We see no reason to not allow this as new equipment for IFR aircraft. It will increase flight safety! And it will be done by a professional.
response	Partially accepted The SC proposes an interim status: ‘direct replacement of an existing awareness function or awareness device on an IFR-certified aircraft.’
comment	105 comment by: <i>DGAC France</i>
	1 Purpose : Color/Attachment criteria of the "combined display" should be defined
response	Accepted Attachment criteria have been added. Since the unit is awareness, colour criteria are interpreted as unusable colours specifically dedicated to warnings and cautions.
comment	106 comment by: <i>DGAC France</i>
	3. Acceptable methods, techniques, and practices <i>"The electronic unit shall be located away from the aircraft instrument required for the flight in order to minimise the risk of interference. Additionally, the installation shall not obstruct the primary field of view of equipment essential for the safe</i>



	<p><i>operation of the aircraft." : Why not retaining this requirement for Electronic Conspicuity equipments (CS-SC057) and for Device receiving uplinked weather radar information (CS-SC253)?</i></p> <p><i>"The equipment manufacturer has declared how flammability protection was considered. Refer to CS STAN.45 in Subpart A for ."</i></p> <p><i>"The equipment manufacturer has declared how the risks associated with internal lithium batteries, if any, were considered. Refer to CS STAN.47 in Subpart A for ."</i></p> <p>The end of the two phrases is missing.</p>
response	<p>Accepted</p> <p>The first part of the comment has been included in CS-SC057 and CS-SC253. The sentences have been corrected.</p> <p>Thank you</p>
comment	<p>160 <span style="float: right;">comment by: <i>Europe Air Sports</i></span></p> <p>We would appreciate a clarification whether the installation of a synthetic vision or enhanced vision system falls under this SC.</p>
response	<p>Accepted</p> <p>In theory, there is no restriction, provided that the requirements are met.</p> <p>In practice, the restriction ‘outside the primary field of view’ could render this SC useless for some applications. Misplacing the unit to avoid the certification process might defeat the operational benefit. Usability highly depends on the specific cockpit arrangement. This SC might be usable for a synthetic flight bag system that would be installed for usage from the passenger’s seat location, for example.</p> <div style="text-align: center;">  <p>Development of a synthetic vision system</p> </div>
comment	<p>221 <span style="float: right;">comment by: <i>EUROCONTROL</i></span></p> <p>Level Medium</p> <p>What is the difference between SC062a and SC057a?</p> <p>To be clarified</p>
response	<p>Accepted</p> <p>The intention is to define a SC in a more generic manner. Electronic conspicuity (EC) is one specific awareness function. In the aircraft eligible to install this SC, pilots tend to carry portable electronic devices for awareness use. Such uninstalled devices might create a risk of injury to occupants. Nothing can prevent pilots from carrying portable electronic devices. Hopefully, this SC can be used to install such systems and limit the potential for injuries to occupants (e.g. contact injuries of the head).</p>



WP3.4-034043-036.p  
df

comment

256

comment by: *FNAM*

**Position:** §3 The example given by the GSM is not relevant because it can create electromagnetic problems with the systems on board the aircraft: Unfavorable opinion.

response

Partially accepted

The GSM example is not included in this specific SC. However, GSM emitters must comply with telecommunications regulations. Required airborne equipment is assessed against interference as defined in the technical standards used for the ETSO authorisation, or equivalent. The ground test checks the absence of interference. No regulation can prevent a pilot from carrying a portable GSM. A pilot is expected to switch off any source of interference and report the issue.

comment

318

comment by: *Airbus Helicopters*

Paragraph No:	Standard Change CS-SC062a INSTALLATION OF AN AWARENESS FUNCTION OR AWARENESS DEVICE / Applicability / eligibility
Comment:	EASA proposal to include direct replacement of an existing awareness function or awareness device on an IFR aircraft needs further explanation. The idiom “direct replacement” is currently not used in Part 21.
Rationale:	The functional implementation of awareness function(s) involves extensive compatibility investigations, beyond the technical resources foreseen for SC. Aircraft tolerance of non ICAO frequencies / devices is usually addressed within Certification Review Items.
Proposed text:	Keep the wording: “This SC can be used to install or replace an awareness function or awareness device in the following cases: — VFR installation (including VFR at night); “ Or restrict the new functional implementation to non IFR operational phases.

response

Partially accepted

For IFR-certified aircraft, an additional limitation for exchange has been added. The compatibility assessment was already performed during the first installation. An exchange implies limited differences of form/fit. The AFMS includes a specific reference to support VFR operations.

For frequency protection: all emitters must comply with telecommunications regulations. Required airborne equipment is assessed against interference as



defined in the technical standards used for the ETSO authorisation, or equivalent. The ground test checks the absence of interference. No regulation can prevent a pilot from carrying a portable emitter (outside the aeronautical frequency band). A pilot is expected to switch off any source of interference and report the issue.

**Standard Change CS-SC081b**

p. 86

comment 161 comment by: *Europe Air Sports*  
Please consider making this SC eligible for the pilot-owner, if necessary using a restricted set of acceptable methods, or requiring a specific training module.

response Please see the response to comment #295.

comment 257 comment by: *FNAM*  
**Position:** No comments: Neutral opinion.

response Noted

comment 295 comment by: *European Sailplane Manufacturers*  
We consider this SC also to be possible for release to service of the aircraft by the pilot-owner.

In the regarding pilot-owner lists in AMC1 to Appendix II to Part-ML — Limited pilot-owner maintenance for sailplanes it is allowed to release for the pilot-owner:

Wheels — removal, replacement and servicing, including replacement of wheel bearings and lubrication

Servicing — replenishment of hydraulic fluid

Shock absorber — replacement or servicing of elastic cords or rubber dampers

Against these tasks it should be not more difficult to replace a tyre / inner tube against another of the same size and strength rating.

response Agreed

The exchange of the tyre by the pilot-owner has been made possible.

**Standard Change CS-SC082 a b**

p. 88

comment 258 comment by: *FNAM*





	<b>Position:</b> No comments: Neutral opinion.
response	Noted

**Standard Change CS-SC083b**

p. 90

comment	259	comment by: <i>FNAM</i>
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**Position:** §3 We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety. Clarification on the method used to perform the test (for example regulatory references).

response	The impact of a non-conformity of a part has been analysed, and meets the criteria as provided in the GM for parts without an EASA Form 1.
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For ELA1 and ELA2 aircraft, it has an effect less than or equal to:

- a slight reduction in the operational or functional capabilities of the aircraft or its safety margins;
- some physical discomfort to its occupants; or
- a slight increase in the workload of the flight crew without requiring the use of emergency procedures.

comment	304	comment by: <i>Malte HOELTKEN</i>
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We suggest to include ELA2 aircraft into this scope. The limitation to ELA1 prohibits ELA2 aircraft very similar to some ELA1 types. For instance, the DA40D is classified as ELA1 and the very similar DA40NG is classified as ELA2. Likewise, the Piper Archer is classified as ELA1 and the very similar Piper Arrow is classified as ELA2.

response	Part 21 gives the limit for ELA1, and this cannot be changed by CS-STAN. EASA understands this special case, but in general this limit makes sense.
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**Standard Change CS-SC086a A1**

p. 92

comment	76	comment by: <i>TCCA , National Aircraft Certification</i>
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Transport Canada (TCCA) has commented on this CS-STAN item for balloons. Typically, TCCA requests that OEM's included such equipment interchangeability approvals in their Balloon Flight Manual (BFM) or BFM Supplement. This ensures that the OEM controls the changes being made on their balloon. As an option, TCCA has used the STC process for a change to such equipment on a balloon.

This interchange of equipment is also complicated by the more recent amendments to CS 31 where more conservative design safety factors have been imposed on new designs that do not match older designs. So, interchangeability of equipment may be one way only.



response	<p>EASA is requested to review the application of this CS-STAN to see if it is being accepted by industry – OEM, modifiers, owners, operators, etc. – and if the same level of safety is being achieved, in reality, with this CS-STAN. Any misuse of the CS-STAN or misunderstanding of its intent could lead to potential safety issues.</p> <p>Noted</p> <p>EASA is continuously monitoring the implementation of CS-STAN and is not aware of nor has concerns regarding any misuse or potential safety issues.</p>
comment	<p>138 comment by: <i>Spanish Aviation Safety and Security Agency (AESA)</i></p> <p>Reference to Regulation points M.A.801 and ML.A.801 are missing (there are only references to AMC's).</p> <p>We propose to add references to M.A.801 and ML.A.801 in point 6 of CS-SC086a A1. Modified text:</p> <p><i>"6. Release to service This SC may be released by the pilot-owner subject to compliance with points <b>M.A.801 or ML.A.801 of Regulation (EU) No 1321/2014 in accordance with</b> AMC M.A.801 or AMC1 ML.A.801 as applicable."</i></p>
response	<p>Accepted</p> <p>Wording has been amended to read: 'This SC may be released by the pilot-owner subject to compliance with point M.A.801 or ML.A.801 of Regulation (EU) No 1321/2014 in accordance with AMC M.A.801 or AMC1 ML.A.801 as applicable.'</p>

## Standard Change CS-SC087a

p. 94

comment	<p>77 comment by: <i>TCCA , National Aircraft Certification</i></p> <p>Transport Canada (TCCA) notes that this CS-STAN is limited to applications where acceptable data can be used, such as, FAA AC 43-13.</p> <p>The CS-STAN appears to be assuming that the design factors of safety are the same for the original part and the new part as the CS-STAN makes reference to "...from any other TC holder...". For example - for fuel cylinder straps and control cords. However, it is not clear in the CS-STAN if this needs to be checked before the part substitution is made or how this is to be checked.</p> <p>EASA is requested to review the intent of the CS-STAN regarding the need to be clear as to how the part substitution is to be confirmed equivalent to the original part and its certification basis.</p>
response	<p>Partially accepted</p> <p>The change is limited to the listed items: steel carabiners, fuel cylinder straps, pilot restraints, control cords and burner rods.</p>



Wording has been amended: 'The exchange of parts is limited to the following items, provided form, fit and function are maintained: ...'

comment 119 comment by: DGAC France

3 Acceptable methods, techniques, and practices

About control cords items from any other TC holder : the phrase in brackets (not applicable to gas balloons certified for flammability gas) should be removed as this limitation is already stated in §2, applicable to all items of this CS.

response Not accepted

The wording is consistent with the applicability; however, it has been kept for clarity.

comment 139 comment by: Spanish Aviation Safety and Security Agency (AESA)

Reference to point ML.A.801 is missing.

We propose to add reference to ML.A.801 in point 6 of CS-SC087a. Modified text:

"6. Release to service

*This SC may be released by the pilot-owner subject to compliance with point M.A.801 or **ML.A.801** of Regulation (EU) No 1321/2014 in accordance with AMC M.A.801 or AMC1 ML.A.801 as applicable.*"

response Accepted

The wording has been amended to read: 'This SC may be released by the pilot-owner subject to compliance with point M.A.801 or ML.A.801 of Regulation (EU) No 1321/2014 in accordance with AMC M.A.801 or AMC1 ML.A.801 as applicable.'

### Standard Change CS-SC101b A1

p. 96

comment 261 comment by: FNAM

**Position:** The addition of the ASTM F2639-18 reference is relevant, however organizations should not be required to have this version because it is not free, unlike the FAA document: Favorable opinion.

We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.

response Noted

The use of the referenced ASTM standard is not mandatory, but only an option.

Not accepted

The release with or without an EASA Form 1 is not an issue in this SC, since ETSO equipment comes with an EASA Form 1.



comment	<p>319</p> <p style="text-align: right;">comment by: <i>Airbus Helicopters</i></p> <table border="1"> <tr> <td>Paragraph No:</td> <td>Standard Change CS-SC101b A1 INSTALLATION OF ELT EQUIPMENT / Applicability / eligibility</td> </tr> <tr> <td>Comment:</td> <td>Address also ETSO-2C520 406-MHz SATELLITE PERSONAL LOCATOR BEACON authorised equipment as an alternative solution for the eligible rotorcraft.</td> </tr> <tr> <td>Rationale:</td> <td>NPA 2121-07 introduces ETSO-2C520 and EASA air operations rules already contain PLB allowance, as alternative solutions to ELT.</td> </tr> <tr> <td>Proposed text:</td> <td>The equipment is authorised in accordance with ETSO-C126a / ETSO-2C520 or later amendments, or equivalent standards</td> </tr> </table>	Paragraph No:	Standard Change CS-SC101b A1 INSTALLATION OF ELT EQUIPMENT / Applicability / eligibility	Comment:	Address also ETSO-2C520 406-MHz SATELLITE PERSONAL LOCATOR BEACON authorised equipment as an alternative solution for the eligible rotorcraft.	Rationale:	NPA 2121-07 introduces ETSO-2C520 and EASA air operations rules already contain PLB allowance, as alternative solutions to ELT.	Proposed text:	The equipment is authorised in accordance with ETSO-C126a / ETSO-2C520 or later amendments, or equivalent standards
Paragraph No:	Standard Change CS-SC101b A1 INSTALLATION OF ELT EQUIPMENT / Applicability / eligibility								
Comment:	Address also ETSO-2C520 406-MHz SATELLITE PERSONAL LOCATOR BEACON authorised equipment as an alternative solution for the eligible rotorcraft.								
Rationale:	NPA 2121-07 introduces ETSO-2C520 and EASA air operations rules already contain PLB allowance, as alternative solutions to ELT.								
Proposed text:	The equipment is authorised in accordance with ETSO-C126a / ETSO-2C520 or later amendments, or equivalent standards								
response	<p>Accepted.</p> <p>This has also been added in the title.</p> <p>Thank you</p>								

<b>Standard Change CS-SC102b</b>	p. 97
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comment	<p>17</p> <p style="text-align: right;">comment by: <i>Samionics / General Aviation Avionics</i></p> <p>"DC-PSS with a maximum power per outlet limited to 20 watts"</p> <p>Clarification needed? 20 Watts - is this the maximum power out for the whole DC-PSS device?</p> <p>Assume we have a panel mounted USB charging device with 2 ea USB ports, so 20 Watts per port x 2 total 40 Watts.</p> <p>USB C charging devices such as the Garmin GSB15 offers up to 27 Watts of charging per port x 2 total 54 Watts.</p> <p>To allow installation of USB C type charging devices the power per port should be increased.</p>
response	<p>Not accepted</p> <p>The 20-Watt limit is per USB outlet. For Standard Changes, EASA considers this limit appropriate, considering the typical use of such outlets.</p>

comment	<p>162</p> <p style="text-align: right;">comment by: <i>Europe Air Sports</i></p> <p>NPA text:</p> <p>"When installed in the cockpit, the DC-PSS shall not:...impair access to, or viewing or operation of cockpit controls or instruments;"</p>
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	<p>Comment:</p> <p>We suggest adding: "the DC-PSS or its associated power cable(s) to the PED(s) shall not:...impair access to, or viewing or operation of cockpit controls or instruments;"</p> <p>Justification:</p> <p>It is not uncommon that dangling USB power cables can easily interfere with controls or panel operations and thus create a hazard.</p>
response	<p>Partially accepted</p> <p>Strictly speaking, 'the power cable(s) to the PED(s)' are not part of the design of the Standard Change. Nevertheless, it is acknowledged that dangling cables may create a hazard. A note has been included to highlight this.</p> <p>'Note: The choice of the position of the DC-PSS in the cockpit should also consider the possible hazard that would result from dangling power cables interfering with any emergency escape means and the access or view of the cockpit controls or instruments.'</p>
comment	<p>262 <span style="float: right;">comment by: <i>FNAM</i></span></p> <p><b>Position:</b> We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.</p> <p><b>Question:</b> Most STCs are at 100 Watts so it would be possible to change the current limitation from 20 Watts minimum to 50 Watts, ideally 100 Watts.</p>
response	<p>Not accepted</p> <p>EASA considers that for a DC-PSS the safety effect of a non-conformity to its design is negligible when installed on the aircraft (please refer to Part 21, GM1 21.A.307(b)(3) and (b)(4)).</p> <p>Consequently, a DC-PSS is eligible for installation without an EASA Form 1.</p>

<b>Standard Change CS-SC104b</b>	p. 99
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comment	<p>263 <span style="float: right;">comment by: <i>FNAM</i></span></p> <p><b>Position:</b> §3 We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.</p>
response	<p>Partially accepted</p> <p>The SC has been modified to clarify that the SC only applies to non-required equipment.</p>

<b>Standard Change CS-SC105b</b>	p. 101
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comment	<p>18 <span style="float: right;">comment by: <i>Samionics / General Aviation Avionics</i></span></p>
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response	<p>In CS-SC102b we install DC power supplied for PED. We have commented on the 300grams limitation in earlier CS-STAN NPA's. Still no change ie the pilot will have to handhold his/her PED since he cant leagaly attach it to the mounting device...</p> <p>The weight limit should be increased to allow the useage of a small tablet as long as the system passes the pull test.</p> <p>Noted</p> <p>Heavier masses, which may injure the occupants or cause other damages, should be retained in a reliable way, not guaranteed by the very generic nature of this SC. A sufficient guarantee may be achieved through certification or through a more specific SC. A dedicated SC specific to PEDs will be considered in a future revision of CS-STAN.</p>
comment	<p>163 <span style="float: right;">comment by: <i>Europe Air Sports</i></span></p> <p>Text in NPA: "The mounting system must be installed on one of the fixed surfaces of the aircraft, i.e. not on any control system components that are subject to motion."</p> <p>Comment: We ask EASA to consider allowing the mounting of very light units on the steering control yoke, as has long been the practice for e.g. stopwatches and approach chart holders. We are not aware of hazards caused by such installations.</p>
response	<p>Noted</p> <p>This could be possible taken into consideration in a future revision of CS-STAN.</p>
comment	<p>264 <span style="float: right;">comment by: <i>FNAM</i></span></p> <p><b>Position:</b> We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.</p> <p><b>Question:</b> When carrying out the resistance tests of the equipment (especially in the event of an emergency landing or an incident), shouldn't the weight of the aircraft be taken as a reference rather than the weight? equipment?</p> <p>Could it be clarified that the limitation of the weight of the equipment set at 300g is only for the "material support" in order not to create confusion. For the whole (iPad &amp; support) a total weight of 600g could be considered.</p> <p>Would it be possible to define more precisely where the mounting system begins and where it ends?</p>
response	<p>Parts and appliances identified in this SC are eligible for installation without an EASA Form 1, because the consequences of a non-conformity to its design are considered to have a negligible safety effect when installed on the product. The failure of an item of a mass of less than 300 g is considered to have a negligible safety effect according to GM1 21.A.307(b)(3) and (b)(4).</p>

- Regarding the question whether the weight of the aircraft should be taken as a reference, the load factors in the SC are considered appropriate for ELA2 aircraft.
- Regarding the question to clarify the limitation of weight, the SC specifies that the total unit mass does not exceed 300 g, with ‘unit’ meaning the ‘equipment’ plus the ‘mounting system’. Therefore, for the case mentioned, since the iPad and support together weigh more than 300 g, they cannot be installed using this SC.

**Standard Change CS-SC106b**

p. 104

comment

265

comment by: *FNAM*

**Position:** The addition of the ASTM F2639-18 reference is relevant, however organizations should not be required to have this version because it is not free, unlike the FAA document: Favorable opinion.

We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.

response

Noted

The use of the referenced ASTM standard is not mandatory, but only an option.

Parts and appliances identified in this SC are eligible for installation without an EASA Form 1, because the consequences of a non-conformity to its design are considered to have a negligible safety effect when installed on the product.

**Standard Change CS-SC107b**

p. 106

comment

120

comment by: *DGAC France*

3 Acceptable methods, techniques, and practices

What is the rationale to require an EMI test for installation of active CO detectors ? They are not transmitters.

response

Noted

Any electrical or electronic equipment, also one not transmitting, requires an EMI test at aircraft level to confirm that the electromagnetic fields do not affect the aircraft functions. Even small currents create electromagnetic fields that can affect aircraft equipment if the CO detector is installed too close to such equipment, for example.

comment

266

comment by: *FNAM*

**Position:** We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.

response

Noted



The impact of a non-conformity of a part has been analysed, and meets the criteria as provided in the GM for parts released without an EASA Form 1.

For ELA1 and ELA2 aircraft, it has an effect less than or equal to:

- a slight reduction in the operational or functional capabilities of the aircraft or its safety margins;
- some physical discomfort to its occupants; or
- a slight increase in the workload of the flight crew without requiring the use of emergency procedures.

**Standard Change CS-SC108a**

p. 108

comment 35 comment by: KSAK - Swedish Royal Aero Club

This should be possible to do as pilot-owner.

response Not accepted

The new equipment shall be provided with adequate qualification (ETSO and rating), which has to be checked by maintenance staff.

comment 107 comment by: DGAC France

3. Acceptable methods, techniques, and practices

*"The supporting structure of the replaced fire extinguisher shall be used to accommodate the new one. Therefore, the new fire extinguisher shall be of similar dimensions."*

A requirement for similar dimensions is not sufficient since it is not related to location and characteristics of structural weakpoints on a specific fire model.

The Fire extinguisher and its supporting structure compatibility should go through a dedicated assessment for structural strength under the loads that may be encountered in non-normal flight conditions. Why not requiring a "Check of strength and stiffness of the installation " as for CS-SC109a

response Partially accepted

The text has been changed to show that it should not require a new assessment, the supporting structure is basically the same, and the extinguisher is of similar dimensions, shape and weight.

comment 121 comment by: DGAC France

2. Applicability/Eligibility

The second dash could be replaced by « - any ELA 2 aircraft ». The applicability should be harmonized with CS-SC109





response Not accepted  
Aircraft with more than 6 pax and pressurised vessels are excluded as they might require compliance demonstration against the CS requirements which is outside the scope of CS-STAN.

comment 267 comment by: *FNAM*  
**Position:** We do not have an unfavorable opinion on this new CS STAN. Nevertheless, is it possible to clearly specify examples or references of extinguishers making it possible to guarantee the same level of extinction (for any type of fire on board an aircraft) as halon extinguishers?

response Not accepted  
The equivalency is indicated in the similarity of the extinguisher rating.

## Standard Change CS-SC109a

p. 109

comment 108 comment by: *DGAC France*  
3. Acceptable methods, techniques, and practices  
"The minimum rating of the fire extinguisher shall be U.S. -UL 2B:C or equivalent." : Why not referring to European standards (e.g. EN 4649)?

response Not accepted  
The US rating indicated is the most commonly used and, therefore, it is referenced. Other ratings from different standards are covered by the wording 'or equivalent'.

comment 122 comment by: *DGAC France*  
2. Applicability/Eligibility  
The applicability/eligibility section should be harmonized with CS-SC108.

response Not accepted  
Aircraft with more than 6 pax and pressurised vessels are excluded as they might require compliance demonstration against the CS requirements which is outside the scope of CS-STAN.  
A new installation in a rotorcraft is not adequately addressed by this Standard Change. The 'Acceptable methods, techniques and practices' quoted in Section 3 are specific to CS-23 and would need to be updated to also cover rotorcraft (e.g. different crash loads). SC108 can be applied since it is for the exchange of already previously certified installations.

comment 268 comment by: *FNAM*  
**Position:** No specific comments: Neutral opinion.



response Noted

**Standard Change CS-SC110a**

p. 112

comment 109 comment by: DGAC France

3. Acceptable methods, techniques, and practices  
*"if warning, caution, or advisory annunciators are exchanged, they must be: — red, for warning indications; this normally denotes a hazard which may require immediate corrective action, — amber, for caution indications; this normally denotes a hazard which may need a future corrective action, — green, for safe-operation indications;"*

We suggest to align with existing CS definitions:  
 (1) Warning: For conditions that require immediate flight crew awareness and immediate flight crew response.  
 (2) Caution: For conditions that require immediate flight crew awareness and subsequent flight crew response.

response Accepted

The proposed text has been inserted.

comment 110 comment by: DGAC France

3. Acceptable methods, techniques, and practices  
*"Annunciators in configuration 2 aggregate aircraft warnings that are either available in another manner if required, or duplicated in this repeater, or added to the minimum warnings required for an aircraft."*

It is not clear why one should allow cases for which aggregated warnings are not available in another manner

It would be expected that aggregated warnings be still available whatever the case, the opposite implying that a single point of failure (not authorised according to an ETSO specification) could result in the loss of multiple warnings.

response Accepted

The intent was to prevent single point failure. The aggregator cannot replace a required annunciator. The text has been reworded.

comment 269 comment by: FNAM

**Position:** From our point of view, it would be necessary to indicate an ETSO reference for all the configurations (1, 2 and 3) in order to ensure the conformity of the equipment to be installed.

We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment: Unfavorable opinion for flight safety.



response Partially accepted

Configuration 3 has an ETSO requirement.

The conditions for Configuration 2 have been clarified (please, see the response to comment #110). Configurations 1 and 2 are based on the 'no hazard, no credit' principle.

In Configuration 2, the new installation is based on a similar, previously certified installation. Moreover, in Configuration 2, in case of doubt, the pilot can compare the annunciation from the aggregator with the annunciation from the required annunciator.

**Standard Change CS-SC152b A1**

p. 115

comment 140 comment by: *Spanish Aviation Safety and Security Agency (AESA)*

Reference to point ML.A.801 is missing.

We propose to add reference to ML.A.801 in point 6 of CS-SC152b A1. Modified text:

*"6. Release to service  
This SC may be released by the pilot-owner subject to compliance with point M.A.801 or **ML.A.801** of Regulation (EU) No 1321/2014 in accordance with AMC M.A.801 or AMC1 ML.A.801 as applicable, in the case of sailplanes, including powered sailplanes."*

response Accepted

comment 270 comment by: *FNAM*

**Position:** No comments: Neutral opinion.  
§6: For Part M, reference is made to point M.A.801 and its AMC.  
For Part ML, reference is only made to AMC, shouldn't point ML.A.801 be added?

response Accepted

Reference to point ML.A.801 has been added.

**Standard Change CS-SC202b A1**

p. 117

comment 141 comment by: *Spanish Aviation Safety and Security Agency (AESA)*

Reference to point ML.A.801 is missing.

We propose to add reference to ML.A.801 in point 6 of CS-SC202b A1. Modified text:

*"6. Release to service*



	<i>The Pilot-owner may release the aircraft to service after embodiment of this SC, subject to compliance with point M.A.801 <b>or ML.A.801</b> of Regulation (EU) No 1321/2014 in accordance with AMC M.A.801 or AMC1 ML.A.801, as applicable."</i>
response	Accepted

comment	274	comment by: FNAM
	<p><b>Position:</b> No comments: Neutral opinion.          §6: For Part M, reference is made to point M.A.801 and its AMC.          For Part ML, reference is only made to AMC, shouldn't point ML.A.801 be added?</p>	
response	Accepted	

<b>Standard Change CS-SC203b A1</b>
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p. 119
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comment	142	comment by: Spanish Aviation Safety and Security Agency (AESA)
	<p>Reference to point ML.A.801 is missing.</p> <p>We propose to add reference to ML.A.801 in point 6 of CS-SC203b A1. Modified text:</p> <p><i>"6. Release to service          The Pilot-owner may release the aircraft to service after embodiment of this SC, subject to compliance with point M.A.801 <b>or ML.A.801</b> of Regulation (EU) No 1321/2014 in accordance with AMC M.A.801 or AMC1 ML.A.801, as applicable."</i></p>	
response	Accepted	

comment	275	comment by: FNAM
	<p><b>Position:</b> No comments: Neutral opinion.          §6: For Part M, reference is made to point M.A.801 and its AMC.          For Part ML, reference is only made to AMC, shouldn't point ML.A.801 be added?</p>	
response	Accepted	

<b>Standard Change CS-SC204b</b>
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p. 121
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comment	164	comment by: Europe Air Sports
	<p>We would like a confirmation that this SC is applicable also to piston-engined TMG aircraft.</p>	
response	<p>Noted</p> <p>The scope of this SC remains unchanged; therefore, the question is unrelated to the NPA — but the pre-heater (ground equipment) can be used for TMG as well.</p>	



comment	276	comment by: <i>FNAM</i>
	<p><b>Position:</b> We are not in favor of the non-obligation of Form 1 type release documents for this type of equipment. This type of installation is complex and requires the expertise of an approved body as well as equipment conforming to the European aeronautical standard: Very unfavorable opinion with a high risk for flight safety.</p>	
response	<p>Noted</p> <p>The impact of a non-conformity of a part has been analysed, and meets the criteria as provided in the GM for parts released without an EASA Form 1.</p> <p>For ELA1 and ELA2 aircraft, it has an effect less than or equal to:</p> <ul style="list-style-type: none"> <li>— a slight reduction in the operational or functional capabilities of the aircraft or its safety margins;</li> <li>— some physical discomfort to its occupants; or</li> <li>— a slight increase in the workload of the flight crew without requiring the use of emergency procedures.</li> </ul>	

<b>Standard Change CS-SC206a A1</b>
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p. 122
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comment	277	comment by: <i>FNAM</i>
	<p><b>Position:</b> Pas de commentaires: Avis neutre.  §6: Pour le Part M, il est fait référence du point M.A.801 et de son AMC.  Pour le Part ML, il est fait uniquement référence de l'AMC, ne faudrait-il pas rajouter le point ML.A.801?</p>	
response	<p>Not accepted</p> <p>This SC is not suitable for pilot-owner release; therefore, normal maintenance procedures apply, which do not need to be referenced.</p>	

<b>Standard Change CS-SC207a A1</b>
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p. 124
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comment	143	comment by: <i>Spanish Aviation Safety and Security Agency (AESA)</i>
	<p>Reference to point ML.A.801 is missing.</p> <p>We propose to add reference to ML.A.801 in point 6 of CS-SC207a A1. Modified text:</p> <p><i>"6. Release to service  This SC may be released by the pilot-owner subject to compliance with point M.A.801 or <b>ML.A.801</b> of Regulation (EU) No 1321/2014 in accordance with AMC M.A.801 or AMC1 ML.A.801, as applicable."</i></p>	
response	<p>Accepted</p>	



comment	278	comment by: FNAM
	<p><b>Position:</b> Pas de commentaires: Avis neutre.          §6: Pour le Part M, il est fait référence du point M.A.801 et de son AMC.          Pour le Part ML, il est fait uniquement référence de l'AMC, ne faudrait-il pas rajouter le point ML.A.801?</p>	
response	Accepted	

## Standard Change CS-SC208a

p. 126

comment	36	comment by: KSAK - Swedish Royal Aero Club										
	<p><i>"The installation of the a multifunction display for powerplant instruments, fuel flow/pressure instrument together with the related parts, has been certified on a similar aircraft by EASA or by a civil aviation authority of a third country that has entered into a bilateral agreement with the EU54 . The equipment manufacturer has declared that the a multifunction display for powerplant instruments is suitable for installation on a specific aircraft and compatible with a specific engine type. Moreover, the equipment manufacturer provides the necessary design data to the installer."</i></p> <p>This is not much different from requiring an STC which will essentially make the SC pointless. We propose that in all SCs with this kind of condition, it is instead left to the installer to decide the suitability for installation on the specific aircraft or – at the very least – that the certification requirement is dropped. We do not accept this!</p>											
response	<p>Partially accepted</p> <p>Opinions are considerably dissenting. Please, see the response to comment #279.</p> <p>This SC is a first step. Arguments could be found to support a risk–benefit assessment. Benefits would be derived from the reduction of undetected engine failures as well as possibly proactive maintenance. This enables at least to proceed without a minor change for a similar installation in a similar aircraft.</p> <p>Configuration 2 replaces an existing system. In that case, an ETSO is required to guarantee minimum functional performance. Only Configuration 1 can install parts without a Form 1.</p> <p>For Configuration 2, the risk assessment is based on FAA AC23.1309-E.</p> <table border="1"> <thead> <tr> <th>Aircraft Function</th> <th>Classification of Failure Conditions Total Loss of Function</th> <th>Loss of Primary Means of Providing Function</th> <th>Misleading and/or Malfunction Without Warning</th> <th>Analysis Consideration</th> </tr> </thead> <tbody> <tr> <td>Display of fuel level indication</td> <td>Minor</td> <td>Minor</td> <td>Minor</td> <td>Pilot is required to calculate fuel range and endurance</td> </tr> </tbody> </table>		Aircraft Function	Classification of Failure Conditions Total Loss of Function	Loss of Primary Means of Providing Function	Misleading and/or Malfunction Without Warning	Analysis Consideration	Display of fuel level indication	Minor	Minor	Minor	Pilot is required to calculate fuel range and endurance
Aircraft Function	Classification of Failure Conditions Total Loss of Function	Loss of Primary Means of Providing Function	Misleading and/or Malfunction Without Warning	Analysis Consideration								
Display of fuel level indication	Minor	Minor	Minor	Pilot is required to calculate fuel range and endurance								



				during normal flight planning operations.
Display of powerplant indication tachometer	Minor	Minor	Minor	Assumes fixed pitch propeller and reciprocating engine; otherwise, a propeller governor will maintain the engine rpm. Turbofan and turbojet engines may need rpm. data for inflight restart capability. Refer to 14 CFR part 23, § 23.1311.
Display of powerplant Cylinder Head Temperature (CHT)	Minor	Minor	Minor	Assumes a CHT indicator is required. Refer to 14 CFR part 23, § 23.1305.
Display of powerplant indication coolant temperature	Minor	Minor	Minor	Refer to 14 CFR part 23, § 23.1305.
Display of powerplant indication oil pressure	Minor	Minor	Minor	Assumes oil temperature is used as a backup.
Display of powerplant indication oil temperature	Minor	Minor	Minor	Assumes oil pressure is used as a backup.
Display of powerplant indication manifold pressure	Minor	Minor	Minor	Assumes backup use of CHT, Engine Gas Temperature (EGT), and possible fuel

				flow readings if installed.
Display of powerplant air inlet temperature	Minor	Minor	Minor	R
Display of powerplant indication fuel pressure	Minor	Minor	Minor	R
Display of powerplant indication fuel flow	Minor	Minor	Major	Manifold pressure and rpm. or torque indications can be used as an emergency backup to control power until a safe landing can be made.
Display of powerplant fire warning	Major	Major	Major	Required for commuter category and part 23 turbojet powered airplanes using special conditions. Part 23 airplanes usually have one fire warning system on board.
Display of powerplant indication thrust	Minor	Minor	Hazardous	System is not normally used in part 23 airplanes. Torque, Engine Pressure Ratio (EPR), EGT, or Turbine Inlet Temperature (TIT), fuel flow, and rpm. are normally displayed





Display of powerplant thrust reverser position	No effect	No effect	Major	No certification credit is given for enhanced performance when a thrust reverser is installed.
Thrust reversal	Minor	Minor	Variable (inadvertent deployment)	No certification credit is given for enhanced performance when a thrust reverser is installed. No credit can be given for a warning.
Display of powerplant torque	Minor	Minor	Major	Misleading torque could affect take-off performance.
Display of powerplant propeller blade angle	No safety effect	No safety effect	No safety effect	System is not normally used in part 23 airplanes. Propeller governor would control rpm.
Electronic displays of significant powerplant parameters	Minor to Hazardous	R	Hazardous	Reversionary display is considered not available. If the risk of possible engine failure due to pilot mishandling can be mitigated by appropriate procedures or by EEC, the loss of function may be major or minor.
Display of air temperature	Minor	R	Minor	R



Display of powerplant torque	Minor	Minor	Major	Misleading torque could affect takeoff performance.
Display of powerplant propeller blade angle	No safety effect	No safety effect	No safety effect	System is not normally used in part 23 airplanes. Propeller governor would control rpm.
Display of air temperature	Minor	R	Minor	R

The risk–benefit ratio for an awareness function was modelled with the following rationale:



Background-safety-benefit-awareness-syst

comment

70

comment by: *Garmin International*

**CS-SC208a Page 126-129:**

There are multiple occurrences of “a multifunction display” that should be corrected to “multifunction display”. e.g., in section 1 Purpose:

- Configuration 1 “optional a multifunction display” should be corrected to “optional multifunction display”, and

- Configuration 2 “a a multifunction display” should be corrected to “a multifunction display”.

There are other instances that also should be corrected.

response

Accepted

Thank you

comment

111

comment by: *DGAC France*

Several typo errors :

"an optional multifunction dispalay" instead of "an optional a multifunction"

"The multifunction display" instead of "The a multifunction display"

response

Accepted



Thank you

comment 165 comment by: *Europe Air Sports*

This SC is strongly supported.

response Noted

comment 279 comment by: *FNAM*

**Position:** From our point of view, it would be necessary to standardize the configurations (1 & 2), in particular on the obligation of release documents (EASA Form 1) and on the mention of ETSO references: Unfavorable opinion.

response Partially accepted

A Form 1 is associated to an ETSO authorisation or equivalent. Please, refer to the reply to comment #36 regarding the risk–benefit approach.

### Standard Change CS-SC209a

p. 130

comment 280 comment by: *FNAM*

**Position:** From our point of view, the addition of this CS STAN is very critical for flight safety and it should be reserved only for approved organizations: Unfavorable opinion.

response Not agreed

Experience with the installation of governors has shown that there is no such criticality for flight safety if the settings are correct. Here, maintenance organisations are used to exchange/install governors and to adjust the settings as far as possible to the correct values. To check the new governor's general settings for conformity with the settings of the previous governor is a task which can be performed by a maintenance organisation.

### Standard Change CS-SC210a

p. 132

comment 37 comment by: *KSAK - Swedish Royal Aero Club*

*"The installation of the fuel flow/pressure instrument, together with the related parts (including transducers), has been certified by EASA or by a civil aviation authority of a third country that has entered into a bilateral agreement with the EU55 . The equipment manufacturer has declared that the fuel flow/pressure instrument is suitable for installation on a specific aircraft and compatible with a specific engine type. Moreover, the equipment manufacturer provides the necessary design data to the installer."*



response	<p>This is not much different from requiring an STC which will essentially make the SC pointless. We propose that in all SCs with this kind of condition, it is instead left to the installer to decide the suitability for installation on the specific aircraft or – at the very least – that the certification requirement is dropped. We do not accept this!</p> <p>Not agreed</p> <p>EASA acknowledges the safety benefit the installation of such units has. However, an adequate installation is necessary to minimise the adverse effects of erroneous fuel flow indication. The condition requires a previous installation approval, either by EASA or by another authority that has concluded a bilateral agreement with EASA. Installation approval does not necessarily mean STC. For example, a minor modification for a single aircraft would be acceptable.</p> <p>EASA has introduced some conditions and limitations (restrictions). These restrictions intend to reduce the risks of erroneous fuel flow indication versus the risks of no fuel flow indication. The installer relies on a previous certified installation and on design data from the equipment manufacturer.</p>
comment	<p>281 <span style="float: right;">comment by: <i>FNAM</i></span></p> <p><b>Position:</b> No specific comments: Neutral opinion.</p>
response	<p>Noted</p>

<b>Standard Change CS-SC251c</b>	<b>p. 135</b>
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comment	<p>112 <span style="float: right;">comment by: <i>DGAC France</i></span></p> <p>Reference to the airplane maintenance manual to perform a pitot-static test should be added.</p>
response	<p>Accepted</p> <p>If a pitot-static system test is needed, it should be performed in accordance with the aircraft maintenance instructions.</p>
comment	<p>282 <span style="float: right;">comment by: <i>FNAM</i></span></p> <p>Position: No specific comments: Neutral opinion.</p>
response	<p>Noted</p>

<b>Standard Change CS-SC252a</b>	<b>p. 137</b>
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comment	<p>113 <span style="float: right;">comment by: <i>DGAC France</i></span></p> <p>3. Acceptable methods, techniques, and practices</p>
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response	<p><i>"The tactile/kinaesthetic stall warning system must be activated by the signal that triggers a warning (<b>light</b> and/or aural cue) indicating an imminent risk of a stall." : we recommend to replace "light" by "visual"</i></p> <p>Partially accepted</p> <p>The wording has been changed to cover visual cues.</p>
comment	<p>114 <span style="float: right;">comment by: DGAC France</span></p> <p>3. Acceptable methods, techniques, and practices  <i>"In order to minimise unforeseen nuisance alerts, the pilot must have the possibility to manually inhibit this tactile/kinaesthetic warning indicator system. The inhibition means must be readily accessible to the pilot. The pilot must be <b>positively</b> informed of such voluntary inhibition."</i></p> <p>What is entended by "positively" is not clear. Does EASA imply that:</p> <ul style="list-style-type: none"> <li>- this information must be unambiguous?</li> <li>- it should be presented in a way (attention getting cues) to catch pilot attention?</li> <li>- pilot should acknowledge system inhibition?</li> </ul>
response	<p>Partially accepted</p> <p>The sentence has been changed to clarify that it should be clear to the pilot when the system is deactivated.</p>
comment	<p>166 <span style="float: right;">comment by: Europe Air Sports</span></p> <p>Text in NPA:  <i>"The tactile/kinaesthetic stall warning exclusively relies on its own systems/units. Additionally, it is only connected to the following features from the existing installation: the power supply, trigger signal (see condition above) and the stick."</i></p> <p>Comment:          We suggest a clarification that the tactile stall warning trigger can be connected either to the original stall warning system or to an Angle-of-Attack indicator system as defined in CS-SC251, if allowed by the manufacturer of the tactile stall warning system.</p>
response	<p>Not accepted</p> <p>This SC allows this warning indication in addition to the already fitted stall-warning system. The SC251 AoA system is not such a system, but also an additional indicator system.</p>
comment	<p>283 <span style="float: right;">comment by: FNAM</span></p> <p><b>Position:</b> Why are VLRs removed from the scope?</p>
response	<p>Noted</p> <p>Stall-warning indicator systems are not rotorcraft equipment.</p>

## Standard Change CS-SC253a

p. 139

comment 71 comment by: *Garmin International*

**CS-SC253a Page 139-141:**

There are multiple occurrences of “the a ‘weather device” that should be corrected to “the weather device”.

response Accepted

Thank you

comment 72 comment by: *Garmin International*

**CS-SC253a Page 139:**

In Section 3, the maximum mass of the weather device is limited to 300g. This is quite low especially for a device powered by internal batteries. We note that Garmin’s GDL 50 is 340g with an internal battery. We recommend increasing the maximum mass to at least 500g or removing the mass limitation altogether.

response Partially accepted

An alternative option is proposed for a mass slightly over 300 g. The equipment manufacturer is expected to provide installation guidance.

comment 167 comment by: *Europe Air Sports*

Please see the comment to CS-SC006a.

response Partially accepted

A proposal might be drafted for the next revision of CS-STAN. Installation on IFR-certified aircraft would require a revised risk–benefit assessment and probably some additional requirements.

comment 228 comment by: *DGAC France*

Page 139:

We suggest the following change:

“— The a ‘weather device can integrate a receiver within or outside the **aeronautical aviation** frequency bands (~~100 MHz–100 GHz frequency range~~).

— The a ‘weather device may comprise an emitter; this emitter shall transmit outside the **aeronautical aviation** frequency bands (**meaning on frequencies allocated to aeronautical services in accordance with telecommunication regulations**) (~~100 MHz–100 GHz frequency range~~).”

response Accepted



Thank you

comment 229 comment by: DGAC France

Considering comment#226 on CS-SC057a, we suggest the following changes :

Page 141: “This SC shall not include a transmitter in the aeronautical frequency **bands (meaning on frequencies allocated to aeronautical services in accordance with telecommunication regulations)spectrum (100 MHz–100 GHz frequency range)**. Any transmitter outside the aviation frequency band must comply with the applicable telecommunications regulations. The operating manual must indicate any restrictions in the usage of related frequencies of use applicable to a specific country or continent.”

response Accepted  
Thank you

comment 284 comment by: FNAM

**Position:** The domain for helicopters almost corresponds to non-complexes.

response Noted  
The definition of ‘non-complex motor-powered aircraft’ in repealed Regulation (EU) No 216/2008 is not maintained in the new Basic Regulation (Regulation (EU) 2018/1139). It was, therefore, decided, pending a more comprehensive update of the existing Standard Changes, not to continue using this outdated terminology for the applicability of new Standard Changes.

comment 320 comment by: Airbus Helicopters

Paragraph No:	Standard Change CS-SC253a INSTALLATION OF A DEVICE RECEIVING UPLINKED WEATHER RADAR INFORMATION / general
Comment:	The weather data source is not addressed
Rationale:	Weather radar information, even if provided as free service, may not be used if older than 15 to 20 minutes.
Proposed text:	Address the aspects above within the subchapter 5 of CS-SC-253a

response Partially accepted  
It has been introduced in a more nuanced manner: used as current data.



comment	38	comment by: <i>KSAK - Swedish Royal Aero Club</i>
	We think that multifunction displays should be allowed without restrictions.	
response	Partially accepted Accepted for non-required basic instruments.	

comment	168	comment by: <i>Europe Air Sports</i>
	Please see the comment to CS-SC006a.	
response	Partially accepted Please, see also the reply to comment #38.	

comment	285	comment by: <i>FNAM</i>
	<b>Position:</b> Pas de commentaires particuliers: Avis neutre.	
response	Noted	

comment	305	comment by: <i>Malte HOELTKEN</i>
	Not all of the instruments under the scope of this SC are mandated by regulation or operation of the aircraft. For example, a turn- and slip instrument is not necessary in sailplanes.  We suggest to remove the requirement of an EASA Form 1 for those instruments not required by operation or certification of the aircraft.  Furthermore, we suggest to extend the scope of this SC to the new installation of instruments (again, as an example the installation of a turn and slip instrument into a sailplane).	
response	Accepted for non-required basic instruments.	

comment	321	comment by: <i>Airbus Helicopters</i>								
	<table border="1"> <tr> <td>Paragraph No:</td> <td>Standard Change CS-SC410d EXCHANGE OF BASIC FLIGHT INSTRUMENTS / general</td> </tr> <tr> <td>Comment:</td> <td>The ETSO authorisations applicable to these flight instruments is not addressed</td> </tr> <tr> <td>Rationale:</td> <td>Flight instruments are designed for aviation use, ETSO authorisation documented evidence enable their replacement foreseen by standard changes criteria.</td> </tr> <tr> <td>Proposed text:</td> <td>Address the aspects above within the subchapter 3 of CS-SC-401d</td> </tr> </table>		Paragraph No:	Standard Change CS-SC410d EXCHANGE OF BASIC FLIGHT INSTRUMENTS / general	Comment:	The ETSO authorisations applicable to these flight instruments is not addressed	Rationale:	Flight instruments are designed for aviation use, ETSO authorisation documented evidence enable their replacement foreseen by standard changes criteria.	Proposed text:	Address the aspects above within the subchapter 3 of CS-SC-401d
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Rationale:	Flight instruments are designed for aviation use, ETSO authorisation documented evidence enable their replacement foreseen by standard changes criteria.									
Proposed text:	Address the aspects above within the subchapter 3 of CS-SC-401d									



response	<p>Partially accepted</p> <p>The text is already in Section 3. 'With the exception of clocks, the instrument is authorised according to the applicable ETSO or the equivalent standard.'</p> <p>This has remained unchanged from the previous version of the SC. It is true that the list of applicable ETSOs is not explicitly listed. The ETSO authorisation requirement is alleviated for non-required equipment (please, see the response to comment #305).</p>
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<b>Standard Change CS-SC402b A1</b>	p. 144
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comment	286	comment by: <i>FNAM</i>
	<b>Position:</b> Pas de commentaires particuliers: Avis neutre.	
response	Noted	

<b>Standard Change CS-SC403a A1</b>	p. 146
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comment	144	comment by: <i>Spanish Aviation Safety and Security Agency (AES)</i>
	Reference to Part ML is missing.	
	We propose to add reference to Part ML in the note of point 6, of CS-SC403a A1. Modified text:	
	<i>"Note: Attaching the camera to the aircraft in accordance with the AFMS is not considered as maintenance according to Part-M <b>or Part ML</b> and does not require a release to service, as the AFMS contains detailed instructions on how to attach the camera and its mounting system."</i>	
response	Accepted	

comment	287	comment by: <i>FNAM</i>
	<b>Position:</b> Pas de commentaires particuliers: Avis neutre.	
response	Noted	

<b>Standard Repair CS-SR802d</b>	p. 150
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comment	129	comment by: <i>Malte HOELTKEN</i>
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	<p>This SR is applicable only to sailplanes, powered sailplanes, LSA and VLA. However, the content of these documents could very well be applied to many ELA1/ELA2 aircraft.</p> <p>For example, this SR is applicable to the Diamond Katana (VLA) and Diamond Dimona (powered sailplane) but not to the mechanically very similar DA40 (ELA1/ELA2). Likewise, the airframe of a Ka-6 glider and a DR-400 ELA1 is mechanically similar enough to be repaired in alignment with the procedures in "Werkstattpraxis für den Bau von Segelflugzeugen und Motorseglern".</p> <p>The applicability of the documents listed in this SR is directly defined by the properties of the structure/systems of the aircraft to be repaired and can be extracted from the document's content by the person responsible for the release of the standard repair. A further limitation seems unnecessary.</p> <p>We suggest to extend the scope of this SR in alignment with SR801:</p> <p>Aeroplanes that are not being complex motor-powered aircraft, and any ELA2 aircraft.</p>
response	<p>Not accepted</p> <p>The scope of this Standard Repair has not been under discussion in this proposed change. It is not appropriate to do so without a formal consultation process.</p>

<b>GM CS STAN.50 Instructions for continued airworthiness (ICAs)</b>	p. 152
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comment	<p>174 ❖ <span style="float: right;">comment by: <i>Malte HOELTKEN</i></span></p> <p>ICA is usually an abbreviation for "Instructions for continuing airworthiness", as defined and used in Regulation (EU) No 1321/2014 and its Appendices. We suggest to adhere to this abbreviation and not change it to "Instructions for continued airworthiness" within this regulation for consistency purposes.</p>
response	<p>Accepted</p> <p>Has been corrected consistently with the title of CS STAN.50.</p>

<b>Template for AFM supplements</b>	p. 156
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comment	<p>10 <span style="float: right;">comment by: <i>Samionics / General Aviation Avionics</i></span></p> <p>Please include most standard headlines and associated numbers iaw Gama Specification in the template.</p> <p>0 Technical Publication Guidance          1 General          2 Limitations          3 Emergency Procedures</p>
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	<p>3A Abnormal Procedures (Optional)</p> <p>4 Normal Procedures</p> <p>5 Performance</p> <p>6 Weight and Balance and Equipment List (if applicable)</p> <p>7 Description of the Airplane and its Systems</p> <p>8 Handling, Servicing and Maintenance</p> <p>9 Supplements</p> <p>10 Safety and Operational Tips (Optional), Alphabetical Index (Optional)</p>
response	<p>Not accepted</p> <p>The section numbering suggested is common for small aeroplanes, and less common for rotorcraft. Hence, a more generic template has been retained.</p>

<b>7. Quality of the document</b>
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p. 162
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comment	<p>322 <span style="float: right;">comment by: <i>Airbus Helicopters</i></span></p> <p>Editorial comment: CMM abbreviation is not defined. It is assumed it means Component Maintenance Manual. Should the reader rely on EASA definitions and abbreviations <a href="https://www.easa.europa.eu/abbreviations">https://www.easa.europa.eu/abbreviations</a> ?</p>
response	<p>Accepted</p> <p>The abbreviation 'CMM' is indeed not included, and has been added in CS STAN.80.</p>

