European Aviation Safety Agency — Rulemaking Directorate

Comment-Response Document 2013-06

Approval requirements for Air-Ground Data Link and ADS-B in support of Interoperability requirements

and

Miscellaneous improvement to AMC 20

CRD TO NPA 2013-06 — RMT.0099 (20.006(b) AND RMT.0599 (20.016) — 17/12/2013
Related Decision 2013/030/R and Decision 2013/031/R

EXECUTIVE SUMMARY

This Comment-Response Document (CRD) contains the comments received on NPA 2013-06 (published on 15 April 2013) and the responses, provided thereto by the Agency.

The purpose of the NPA was to propose new sections for the Certification Specifications (CSs) presented in NPA 2012-19 and to transpose existing JAA Temporary Guidance Leaflets (TGL) material. The new sections are to provide CS and Guidance Material to ensure safe and interoperable operations while demonstrating that airborne installations compliance with both Commission Regulation (EC) No 29/2009 'Data link services' and Commission Implementing Regulation (EU) No 1079/2012 'Voice channels spacing'. In addition, the NPA proposed a transposition and updating of JAA TGL 6 – Reduced Vertical Separation Minima RVSM and JAA TGL 12 – Terrain Awareness Warning System (TAWS).

Based on the comments and responses, ED Decisions 2013/030/R and 2013/031/R were developed and published simultaneously with this CRD, as allowed by the rulemaking procedure adopted by the Agency's Management Board on 13 March 2012.

Applicability		Process map	
Affected regulations and decisions:	CS-ACNS AMC-20	Concept Paper:	No
		Rulemaking group:	No
		RIA type:	Light
Affected stakeholders:	Design Organisations	Technical consultation during NPA drafting:	No
		Publication date of the NPA:	15/04/2013
Driver/origin:	Level Playing Field and Safety	Duration of NPA consultation:	3 months
		Review group:	No
Reference:	Commission Regulation (EC) No 29/2009	Focussed consultation:	No
		Publication date of the Opinion:	N/A
	Commission Implementing Regulation (EU) No 1079/2012	Publication date of the Decision:	In parallel with this CRD

Table of contents

1 Procedural information
The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed this Comment-Response Document (CRD) in line with Regulation (EC) No 216/2008[1] (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure[2].

This rulemaking activity is included in the Agency's Rulemaking Programme for 2013, under RMT.0099 (20.006(b) and RMT.0559 (20.016). The scope and timescale of the task were defined in the related Terms of Reference (see process map on the title page).

The draft Certification Specification has been developed by the Agency. All interested parties were consulted through NPA 2013-06[3], which was published on 15 April 2013. 140 comments were received from interested parties, including industry and national aviation authorities.

The text of this CRD has been developed by the Agency.

The process map on the title page contains the major milestones of this rulemaking activity.

1.1 The structure of this CRD and related documents

This CRD provides the full set of individual comments (and responses thereto) received to NPA 2013-06. The resulting text is provided in Annex I to ED Decision 2013/030/R and Annex I to ED Decision 2013/031/R that are published together with this CRD.

1.2 The next steps in the procedure

The related ED Decisions are published by the Agency together with this CRD.

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[1] Regulation (EC) No 216/2008 of the European Parliament and the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1), as last amended by Commission Regulation (EU) No 6/2013 of 8 January 2013 (OJ L 4, 9.1.2013, p. 34).

[2] The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See Management Board Decision concerning the procedure to be applied by the Agency for the issuing of Opinions, Certification Specifications and Guidance Material (Rulemaking Procedure), EASA MB Decision No 01-2012 of 13 March 2012.

[3] http://easa.europa.eu/rulemaking/notices-of-proposed-amendment-NPA.php

2 Summary of comments and responses

The purpose of the Notice of Proposed Amendment (NPA) 2013-06 was to complement the Certification Specification (CS-ACNS) as presented in NPA 2012-19 with other Communications, Navigation and Surveillance related certification and interoperability standards. In particular the NPA proposed the certification standard to addresses both Commission Regulation (EC) No 29/2009[4], related to data link services and Commission Implementing Regulation (EU) No 1079/2012[5], related to voice channels spacing. It also proposed the certification and interoperability standards for Reduce Vertical Separation Minima (RVSM), 8.33 kHz voice communications and Terrain Awareness Warning System TAWS Class A and Class B.

In total, 140 comments were received from industry and national aviation authorities during the consultation of the NPA. The comments were made by 17 users on 30 segments on this NPA. These 140 comments were responded as follows: 63 - accepted, 22 - partially accepted, 36 - noted, 19 – not accepted.

The distribution of the comments per NPA sectors is the following:

S	Page	Description	Comments
0	-	(General Comments)	15
1	3-4	A. Explanatory Note - I. General	1
2	5	A. Explanatory Note - IV. Content of the draft Decision	1
3	6	A. Explanatory Note - IV. Content of the draft Decision - Voice Channel Spacing (8.33 kHz)	1
4	6-7	A. Explanatory Note - IV. Content of the draft Decision - Data link	1
5	7-8	A. Explanatory Note - IV. Content of the draft Decision - Terrain Awareness Warning System (TAWS)	8
6	8	A. Explanatory Note - IV. Content of the draft Decision - Reduced Vertical Separation Minima (RVSM)	1
7	12-14	B. Draft Decision - CS–ACNS - Book 1 - SUBPART A	6
8	15	B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 1 – VOICE CHANNEL SPACING (VCS) - System performance requirements	3
9	16	B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - General	2
10	16	B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - Flight deck control and indication capabilities	3
11	17	B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - System performance requirements	3
12	17	B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - Time	1
13	18-21	B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - CPDLC Messages	7
14	23	B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS) - General	3
15	23-26	B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS) - System functional requirements	18
16	26	B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS) - Safety objectives	10
17	26-27	B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN	3

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4 Commission Regulation (EC) No 29/2009 of 16 January 2009 laying down requirements on data link services for the single European sky (OJ L13, 17.1.2009, p.3)

5 Commission Implementing Regulation (EU) No 1079/2012 of 16 November 2012 laying down requirements for voice channels spacing for the single European sky (OJ L 320, 17.11.2012, p.14)

S	Page	Description	Comments
		AWARENESS WARNING SYSTEM (TAWS) - System performance requirements	
18	27-28	B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS) - Installation requirements	2
19	29	B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 2 – REDUCED VERTICAL SEPARATION MINIMUM (RVSM) - General	2
20	30	B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 2 – REDUCED VERTICAL SEPARATION MINIMUM (RVSM) - Safety objectives	1
21	30	B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 2 – REDUCED VERTICAL SEPARATION MINIMUM (RVSM) - System performance requirements	1
22	32	B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 – ATN B1 DATA LINK SERVICES - General	3
23	33-35	B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 –ATN B1 DATA LINK SERVICES - Flight Deck Control and Indication Capabilities	4
24	35-37	B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 –ATN B1 DATA LINK SERVICES - ATN B1 Data link	2
25	38-43	B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 –ATN B1 DATA LINK SERVICES - CPDLC messages	7
26	43-44	B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 –ATN B1 DATA LINK SERVICES - Data link services requirements	2
27	48-55	B. Draft Decision - CS–ACNS - Book 2 - SUBPART E — OTHERS - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS)	21
28	56-57	B. Draft Decision - CS–ACNS - Book 2 - SUBPART E — OTHERS - SECTION 1 - APPENDIX 1: TAWS INSTALLATIONS TESTING GUIDANCE MATERIAL	6
29	58	B. Draft Decision - CS–ACNS - Book 2 - SUBPART E — OTHERS - SECTION 1 - APPENDIX 2: EXAMPLE OF AN ACCEPTABLE TAWS INSTALLATION	2

All comments received were generally supportive of the proposed Certification Specification and either propose improvement to the text or requested clarification.

Following publication of the NPA the Agency has amended the format of the reference numbers to be used in new Certification Specifications. Thus for CS-ACNS the reference number are as follows.

CS ACNS.X.YY.NNN

Where
X= Subpart
YY = Section
NNN = reference number.

The following table provides a cross reference between the NPA reference and references to the CS paragraphs that are published in ED Decision 2013/031/R.

NPA Reference	Decision Reference	Subject
SUBPART B — COMMUNICATIONS		
SECTION 1 – VOICE CHANNEL SPACING (VCS)		
CS ACNS.VCS.1000	CS ACNS.B.VCS.001	Applicability
CS ACNS.VCS.2000	CS ACNS.B.VCS.010	Voice Communication System
CS ACNS.VCS.3000	CS ACNS.B.VCS.020	Performance Requirements
CS ACNS.VCS.3010	CS ACNS.B.VCS.025	Integrity
CS ACNS.VCS.3020	CS ACNS.B.VCS.030	Continuity
CS ACNS.VCS.4000	CS ACNS.B.VCS.040	Flight Deck Interface
SECTION 2 –DATA LINK SERVICES (DLS)		
CS ACNS.DLS.B1.1000	CS ACNS.B.DLS.B1.001	Applicability
CS ACNS.DLS.B1.1001	CS ACNS.B.DLS.B1.005	Installation Requirements
CS ACNS.DLS.B1.1010	CS ACNS.B.DLS.B1.010	Flight Deck Interface
CS ACNS.DLS.B1.1011	CS ACNS.B.DLS.B1.015	Dual Data Link Capabilities (Dual stack)
CS ACNS.DLS.B1.2000	CS ACNS.B.DLS.B1.020	Data Link Services
CS ACNS.DLS.B1.2001	CS ACNS.B.DLS.B1.025	Protection mechanism
CS ACNS.DLS.B1.3000	CS ACNS.B.DLS.B1.030	Integrity
CS ACNS.DLS.B1.3010	CS ACNS.B.DLS.B1.035	Continuity
CS ACNS.DLS.B1.3101	CS ACNS.B.DLS.B1.040	Universal Time Coordinated (UTC)
CS ACNS.DLS.B1.3201	CS ACNS.B.DLS.B1.050	DLIC Uplink Messages
CS ACNS.DLS.B1.3202	CS ACNS.B.DLS.B1.055	DLIC Downlink Messages
CS ACNS.DLS.B1.3203	CS ACNS.B.DLS.B1.060	DLIC Initiation when in CPDLC Inhibited State (Uplink)
CS ACNS.DLS.B1.3301	CS ACNS.B.DLS.B1.070	CPDLC Uplink Messages
CS ACNS.DLS.B1.3302	CS ACNS.B.DLS.B1.075	CPDLC Downlink Messages
CS ACNS.DLS.B1.4101	CS ACNS.B.DLS.B1.080	Data Link Initiation Capability (DLIC) Service
CS ACNS.DLS.B1.4201	CS ACNS.B.DLS.B1.085	ATC Communications Management (ACM) Service
CS ACNS.DLS.B1.4301	CS ACNS.B.DLS.B1.090	ACL Service Safety Requirements
CS ACNS.DLS.B1.4401	CS ACNS.B.DLS.B1.095	ATC Microphone Check (AMC) Service
CS ACNS.DLS.B1.4531	CS ACNS.B.DLS.B1.100	Network Layer Requirements
CS ACNS.DLS.B1.4541	CS ACNS.B.DLS.B1.105	Transport Layer Protocol Requirements
CS ACNS.DLS.B1.4551	CS ACNS.B.DLS.B1.110	Session Layer Requirement
CS ACNS.DLS.B1.4561	CS ACNS.B.DLS.B1.115	Presentation Layer Requirements
CS ACNS.DLS.B1.4571	CS ACNS.B.DLS.B1.120	Application Layer Requirements

Subpart E – Others

SECTION 1 – TERRAIN AWARENESS AND WARNING SYSTEM (TAWS)

NPA Reference	Decision Reference	Subject
CS ACNS.TAWS.1000	CS ACNS.E.TAWS.001	Applicability
CS ACNS.TAWS.1010	CS ACNS.E.TAWS.005	TAWS Equipment Approval
CS ACNS.TAWS.2010	CS ACNS.E.TAWS.010	Required Functions and Interfaces
CS ACNS.TAWS.2020	CS ACNS.E.TAWS.015	FLTA function requirements
CS ACNS.TAWS.2030	CS ACNS.E.TAWS.020	PDA function requirements

NPA Reference	Decision Reference	Subject
CS ACNS.TAWS.2040	CS ACNS.E.TAWS.025	Class A TAWS inhibition
CS ACNS.TAWS.2050	CS ACNS.E.TAWS.030	Terrain information display
CS ACNS.TAWS.2060	CS ACNS.E.TAWS.035	Aural and visual alerts
CS ACNS.TAWS.3000	CS ACNS.E.TAWS.040	Integrity
CS ACNS.TAWS.3010	CS ACNS.E.TAWS.050	GPWS
CS ACNS.TAWS.3020	CS ACNS.E.TAWS.055	Terrain and airport information
CS ACNS.TAWS.3030	CS ACNS.E.TAWS.060	Positioning information
CS ACNS.TAWS.4000	CS ACNS.E.TAWS.070	Failure mode
CS ACNS.TAWS.4010	CS ACNS.E.TAWS.075	Prioritisation scheme
CS ACNS.TAWS.4020	CS ACNS.E.TAWS.080	Pop-up mode

SECTION 2 – REDUCED VERTICAL SEPARATION MINIMUM (RVSM)

NPA Reference	Decision Reference	Subject
CS ACNS.RVSM.1000	CS ACNS.E.RVSM.001	Applicability
CS ACNS.RVSM.1010	CS ACNS.E.RVSM.005	RVSM system
CS ACNS.RVSM.2000	CS ACNS.E.RVSM.010	Required functions
CS ACNS.RVSM.3000	CS ACNS.E.RVSM.020	Integrity
CS ACNS.RVSM.3010	CS ACNS.E.RVSM.025	Continuity
CS ACNS.RVSM.3020	CS ACNS.E.RVSM.030	RVSM system performance
CS ACNS.RVSM.3030	CS ACNS.E.RVSM.035	Altimetry system accuracy

3   Individual comments (and responses)

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

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

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

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

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

(General comments)	-

comment	*7*	comment by: *CANSO Civil Air Navigation Services Organization*

EN 303 214 "Data Link Services (DLS) System; Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004; Requirements for ground constituents and system testing" specifies air-ground common test scenarios. This EN is not reflected in the document. CANSO proposes that for the objective of interoperability the common test scenarios thereof shall be required as a minimum for airworthiness certification, i.e. the airborne equipment shall be subject to a test against a ground station with declared conformity according to the Implementing Rule 29/2009.

response | *Partially accepted*

The reference EN is only applicable to the demonstration of compliance for ground based systems. To provide actual evidence, these interface tests should be undertaken with a ground system to be declared in compliance with the EN, However, to be complaint with the EN, the ground system need to verified on the basis of real tests with a certified aircraft. Thus to ensure that circular requirement was not published reference to the EN has not been included.
Such interface testing using real ground systems could be proposed by the applicants but are not mandatory; it is up to the applicant to define its own process to demonstrate conformity with the CS-ACNS. It is proposed to identify a new AMC (AMC2 ACNS.DLS.B1.2000 Datalink Services) describing tests with verified ground system / ground system simulator. The test scenarios described in Community Specification EN 303 214 'Data Link Services (DLS) System' will be referenced, in a note, as a source of test scenarios. See also response to comment #1.

comment	*8*	comment by: *Luftfahrt-Bundesamt*

The LBA has no comments on NPA 2013-06.

response | *Noted*

The Agency thanks you for your support.

comment	*15*	comment by: *UK CAA*
	From the UK CAA Please be informed that the UK CAA has no comments to make on the NPA 2013-06 'Approval requirements for Air-Ground Data Link and ADS-B in support of interoperability requirements and Miscellaneous improvement to AMC 20.'	
response	*Noted* The Agency thanks you for your support.	

comment	*16*		comment by: *THALES AVIONICS*
	General	**Page :** all	**Reference :**

Current NPA text :
As expressed in its title, this NPA relates to Approval requirements for Air-Ground Data Link and ADS-B in support of Interoperability requirements and miscellaneous improvements to AMC20**.**

Thales concern :
1) This title is misleading as this NPA does not address ADS-B requirements, Conversely this NPA addresses other subjects not explicitly expressed in its title, i.e. 8.33 KHz, RVSM and TAWS
2) This NPA mixes a proposal for Datalink requirements together with transposition and updates of existing regulations (TGL7 - TGL 6 - TGL 12) in the same document

Rationale for action :
As a consequence, concerns are :
- some comments may be missing due to the inappropriate title
- as transposition of existing TGL regulations are made with some updates, new regulations on those additional subject won't be equivalent to existing regulations, and therefore rationale for their updates should not be mixed with other important subjects such as Datalink, and should be addressed separately

Action & rewording proposal:
It is suggested to
1) To rename the title of this NPA appropriately with its contents
2) To split this NPA in 2 parts,
- one dedicated to "Approval requirements for Air-Ground Data Link in support of Interoperability requirements"
- and a separate one dedicated to transposition and updates (if necessary) of existing TGL regulations

response	*Not accepted* The title of the NPA is directly derived from the title of the corresponding EASA Rulemaking task, 20.006 - Miscellaneous improvement to AMC-20 and 20.016 - Approval requirements for Air-Ground Data Link and Surveillance systems in support of Interoperability requirements . The process is to progressively populate the different sections of the CS-ACNS

with the relevant requirements and AMC/GM. It is not possible to re-launch the NPA has it would significantly delay the process. Initially it was foreseen to group ADS-B/Mode S and DLS in one NPA and to have the TGL transpositions in another NPA but eventually this was not possible and the grouping was made differently (ADS-B/Mode S in one NPA and DLS+TGL in another NPA) leading to the title of this NPA. It is to be noted that the transposition of TGL 10 will now be performed in the frame of RMT 0519/0250 (PBN).

comment	*59*	comment by: *DGAC France*

DGAC France has no specific comment on this NPA

response	*Noted*

The Agency thanks you for your support.

comment	*68*	comment by: *AIRBUS*

Comment / Proposed text: We suggest adding an appendix in order to identify all the documents & standards (with their complete reference) quoted in the proposed rule.
Rationale / reasons for comments: An appendix recording the detailed references of all the quoted standards and/or ICAO documents is missing (doc 4444, ED-120, ED-122 …)

response	*Accepted*

Appendices have been inserted in book 2 as Background Information listing the referenced ICAO documents and other standards (e.g. EUROCAE).

comment	*69*	comment by: *Eurocopter*

General comments about safety performance requirements:
- The specification of safety objectives is provided under subsections named "*System Performance Requirements*" or "*Safety objectives*" or even "*Installation requirements*", depending on the subpart or section : this may be misleading ; a suggestion is to adopt a unique wording (and homogeneous with other subparts of CS ACNS).
- It seems (although not always explicit) that "Integrity" applies (in most cases) to the anomalous behaviour of the function, even though data integrity might not be the only possible anomalous behaviour, and "Continuity" applies to the loss of the function. A more appropriate (safety related) wording should be used. If the terms" Integrity" and "Continuity" are kept, definitions should be provided.
- Unexpected events should be clearly specified (e.g. undetected erroneous data transmission, loss of function …).
- Only the criticality of the events (Minor, Major …) should be indicated; qualitative probability wording (like "probable") should not be used, because such wording depends on the type of aircraft and associated certification specification (CS-23, CS-25, CS-27, CS-29 …); it is up to the aircraft manufacturer to ensure that appropriate precautions are taken to cope with the criticality of the undesired events, according to applicable

safety rules.
- Except where it is specified that the system shall be capable of at least a given level of "integrity" or "continuity" ("… *better than or equal to* …"), it is not clear whether the definition of criticalities is intended to provide minimum "integrity" or "continuity" levels or to specify exactly expected levels. In the latter case, this might induce limitations in the operational use of the system.
- At last, it is not clear whether the definitions of criticality levels and the safety assessment process should be based on § xx.1309 and associated AMC.

<u>NOTE</u>: These general comments are related to paragraphs CS ACNS.VCS.3010, CS ACNS.VCS.3020, CS ACNS.DLS.B1.3000, CS ACNS.DLS.B1.3010, CS ACNS.TAWS.3000, CS ACNS.TAWS.3010, CS ACNS.TAWS.4000, CS ACNS.RVSM.3000 and CS ACNS.RVSM.3010. No complementary comment is provided for those paragraphs, unless specific issues are found.

response	*Partially accepted*
	The use of '*System Performance Requirements*' or '*Safety objectives*' or even "*Installation requirements*" is accepted as misleading hen containing the same provisions. The use of the appropriate description has been rationalised within the CS.
	In Book1 the different specifications address Integrity of the system (provision of incorrect information) and Continuity of the system (loss of function/data). Integrity is specified in terms of failure condition whereas Continuity is specified in terms of qualitative (and quantitative when necessary) probability.
	The definitions of Continuity, Integrity Failure condition and qualitative probability terms definitions have been added.

comment	*88*	comment by: *Eurocopter*
	Task RMT.0559 (20.016) is unduly named RMT.0099 in page 1 and RMT.0599 in page 3.	

response	*Noted*
	The Agency apologises for the RMT numbering errors in the Explanatory Note.

comment	*115*	comment by: *AIRBUS*
	<u>General comment</u> The paragraph CS ACNS.GEN.1000 Applicability (NPA 2012-09) and the preamble of the NPA 2013-06 do not provide sufficient information regarding the applicability of the rule. The Agency should clearly state in which context the CS-ACNS will be applicable, for each Subpart/Section of the rule. In particular, it should be clarified if the Sections are applicable to new aircraft types, major modifications or significant modifications in the domain of CNS.	

response	*Noted*
	The CS ACNS is not a rule. It is a means of compliance that an applicant may use to demonstrate compliance simultaneously with the Airworthiness safety requirements and the Single European Sky interoperability requirements. The application of this CS provides a means of compliance with some of the Single European Sky Interoperability regulations (in this case of this NPA, Regulations (EC) No 29/2009 and (EU) No 1079/2012).

It should be noted that for reference, Chapter C of the NPA provides the traceability between the provisions of this CS applicable to the airborne Data Link System and to the airborne Voice Communication System and the relevant parts of regulations (EC) No 29/2009 and (EU) No 1079/2012, respectively, which are only applicable within the airspace of applicability of these regulations.

comment	*117*	comment by: *AIRBUS*

General comment
The proposed rule includes different levels of granularity.
The CS-ACNS, in particular for the Data Link aspects, includes reference to highly detailed technical specifications. Stakeholders are not used to this level of details in a Certification Specification developed for use at aircraft level.
Reference to the appropriate standards should be preferred, provided that they are properly listed with their title, origin and issue.

response	*Partially accepted*

Appropriate standards are already referenced as necessary with origin and issue, however, the full title has been added for completeness to Book 1 references.

comment	*118*	comment by: *AIRBUS*

General comment
Airbus understands from the proposed text that the wording "Integrity" is used to describe abnormal behaviour of the function, whereas the term "Continuity" is used for the loss of the function. A more appropriate (safety related) wording should be used. If the terms "Integrity" and "Continuity" are kept, definitions should be provided.

response	*Accepted*

Definitions have been added to the definition section.

comment	*120*	comment by: *Poonam Richardet*

Attachment #1

Please See comments from Cessna Aircraft Company on the following
NPA 2013-06 –"Approval requirements for Air-Ground Data Link and ADS-B in support of Interoperability requirements."
Thank you.
Poonam Richardet
Analyst Engrg Procedures
Regulatory Affairs/Dept.-381
Cessna Aircraft Company
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response	*Noted*

The text proposed in this NPA supplements the text of CS ACNS proposed in NPA

2012-19. The resulting text from NPA 2012-19 was not formally published when this NPA was submitted for comment. Once published the CS can be found at https://easa.europa.eu/official-publication/.

comment	*121*	comment by: *Swiss International Airlines / Bruno Pfister*

SWISS Intl. Air Lines takes note of the NPA 2013-06 without further comments.

response	*Noted*

The Agency thanks you for your support.

comment	*122*	comment by: *Garmin International*

Regarding the entire document:

Per the NPA 2012-19 description of applicability in CS ACNS.GEN.1000, "these Certification Specifications are applicable to all aircraft for the purpose of compliance with airspace equipage requirements with respect to on-board Communication, Navigation and Surveillance systems." Guidance for Surveillance systems was presented in NPA 2012-19 and NPA 2013-06 provides guidance for 'Data link services', 'Voice channels spacing', RVSM, and TAWS. It can be assumed that the CS ACNS will undergo multiple additional changes as more material is added. Multiple changes will create undue burden as industry must continually update and show compliance to the most recent version. Even if material is simply added, compliance must be shown again for each release.

As an example illustrating the difficulty associated with review of this combined CS ACNS, consider that NPA 2013-06 only includes the proposed "differences" from the NPA 2012-19 CS ACNS that isn't even available in final form. Consequently, it is not possible to review the CS ACNS along with NPA 2013-06 to provide context for the NPA 2013-06 changes. Given the high probability of additional changes to the CS ACNS as more material is added, it can be assumed that this difficulty will continue to be an issue.

Garmin does not believe that this approach to issuing guidance is either practical or workable from either an agency or applicant perspective.

At the very least, the agency is encouraged to break these specifications into at least three separate specification documents that address Communication, Navigation and Surveillance equipment separately.

response	*Not accepted*

As the title of the document indicates, this CS-ACNS will address Communication, Navigation and Surveillance as well as Others (e.g. TAWS, RVSM). It is not the Agency intention to create separate documents but to keep the current structure with dedicated Subparts addressing respectively General, Communication, Navigation, Surveillance and Others.

Compliance with the standard as specified in the CS are only applicable at the time an application for a change is made, there is no requirement for the holder of a certificate to continually demonstrate compliance.

comment	*143*	comment by: *Garmin International*

Attachment #2

The document that was available for download has slightly different page numbering from the document available for commenting. Suggest making them

	the same for ease of commenting.
response	*Noted* The Agency notes different page numberings and will endeavour to ascertain where then error occurred.

A. Explanatory Note - I. General   p. 3-4

comment	*57* comment by: *skyguide Corporate Regulation Management*
	1. General Comment On-board NSAP addresses need to be kept up-to-date with the latest ICAO EUR NSAP Address registry at all times. *Implementation of CPDLC in Switzerland showed that many aircraft operators are unable to use the service due to the outdated on-board NSAP registry, although the ICAO EUR NSAP registry had been updated for more than a year before the implementation.*
response	*Noted* The Agency notes the issue identified, although this is not within the scope of the CS, the issue will be further investigated and the appropriate actions identified.

A. Explanatory Note - IV. Content of the draft Decision   p. 5

comment	*62* comment by: *General Aviation Manufacturers Association / Hennig*
	The General Aviation Manufacturers Association (GAMA) notes the agency's work over the past year to integrate all communication, navigation and surveillance (CNS) guidance in a single Certification Specification (CS) document titled CS-ACNS. This NPA (2013-06) is the second consultation conducted by the agency in support of the development of this CS-ACNS guidance. The CS-ACNS document would contain a broad set of guidance that covers diverse requirements and will be subject to frequent updates, some of which likely would occur in parallel. We recognize that there may be clear benefits from this single document (for example, bringing together all PBN guidance, RNP and RNAV, into one place may clear up some matters), but it is our view that the management of such a document would require significant resources for the agency that may outweigh the benefits. The agency would have to take steps to ensure that the there is version control on the "common guidance" to avoid industry having to continually update and show compliance with the most recent requirements (that is, an update is done for communications that contains a tweak to a common requirement for navigation or surveillance which results unintended or hard to track changes imposed in these areas.) GAMA recommends that the agency conduct a thorough review of the planned use and management, long-term, of CS-ACNS and that this review include consideration of, at a minimum, managing the CS-ACNS document as part of three documents for "CS-AC", "CS-AN" and "CS-AS" for the communication, navigation and surveillance realm which likely would strike the right balance between efficiency (in the number of documents and the clarity provided) and the risk of creating standards management issues. A combined document covering

	CNS does not at this time seem workable.
response	*Not accepted* The Agency thanks GAMA for their support in integrating all communication, navigation and surveillance (CNS) guidance in a single Certification Specification. As the title of the document indicates, this CS ACNS will address Communication, Navigation and Surveillance as well as Others. It is not the Agency intention to create separate documents but to keep the current structure with dedicated Subparts addressing respectively General, Communication, Navigation, Surveillance and Others. Compliance with the standard as specified in the CS are only applicable at the time an application for a change is made, there is no requirement for the holder of a certificate to continually demonstrate compliance.

A. Explanatory Note - IV. Content of the draft Decision - Voice Channel Spacing (8.33 kHz)   p. 6

comment	*9*	comment by: *Bombardier Aerospace*
	From the perspective of a systems integrator, we support the proposed VCS standards as written.	
response	*Noted* The Agency thanks you for your support.	

A. Explanatory Note - IV. Content of the draft Decision - Data link   p. 6-7

comment	*13*	comment by: *Bombardier Aerospace*
	We support the addition of data link system standards to CS ACNS. The proposed Data Link requirements are harmonized with existing Special Conditions and advisory material for ATN B1 data link, as well as the existing guidance for FANS 1/A. We have one comment on the dual stack system requirements but otherwise support the proposal from a system integration perspective.	
response	*Noted* The Agency thanks you for your support.	

A. Explanatory Note - IV. Content of the draft Decision - Terrain Awareness Warning System (TAWS)   p. 7-8

comment	*10*	comment by: *Bombardier Aerospace*
	From the perspective of a systems integrator, we support the proposed TAWS standards as written.	
response	*Noted* The Agency thanks you for your support.	
comment	*19*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P7-8 & P23-28 & P46-55	**Reference :** General comment

Thales general comment :
It should be noticed that TAWS technology has been initially designed by THALES and results from a long-lasting experience and knowledge in terrain avoidance and terrain following, with numerous and tedious studies and developments to provide acceptable performances of such TAWS technology with regard to the major issue of providing as far as possible all necessary alerts while alleviating as far as possible nuisance alerts.

TAWS technology is not an aircraft system as such but a "safety net", designed to provide (with empiric logics) as far as possible the best performance in most situations where aircraft operation or some on-board aircraft systems are not all fully operative as expected.

It should also be noticed that TAWS is not to-date an "open" technology since TAWS functionalities are covered by numerous patents.

response | *Noted*

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comment | *31*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P7-8 & P23-28 & P46-55	**Reference :** General comment

Thales concern & Rationale for action :
Most of the TAWS requirements contained in this NPA duplicate those already defined in current ETSO C151B. But as those TAWS requirements are rewritten in a different manner (e.g. the TAWS functions are rewritten in a different order with some differences), it is difficult to ensure that those TAWS requirements contained in this NPA do not present discrepancies with existing ETSO C151B.
Action & rewording proposal:
Therefore, it is recommended to suppress in this NPA all requirements which are already part of the ETSO C151B to ensure full consistency between this future regulation and ETSO C151B requirements, while focusing here on operational and system integration considerations.

response | *Not accepted*

It is noted the CS contains similar requirements to those specified on the ETSO.

However , these requirements are aircraft level requirements and not applicable to the equipment. As correctly identified that are full consistent and it is the Agency intent to update the ETSO accordingly.

comment	*32*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P5 & P7 P23-25 & P27 P46-50 & P55	**Reference :** General comment

Current NPA text :
Class A and Class B TAWS
Thales concern & Rationale for action :
Several TAWS requirements contained in this NPA are referring to Class A or Class B TAWS, but the those terms, i.e. the functionalities composing those classes, are not defined in this NPA. However, those terms are defined in ETSO C151B.
Action & rewording proposal:
Therefore, in line with previous comment, it is suggested to mention that the definition of those terms are provided in ETSO C151B, as follows : "Class A & Class B TAWs classification is defined in ETSO C151B".

response	*Not accepted*

The functionalities applicable to each class are defined in CA ACNS.TAWS.1010.

comment	*33*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P7 & P46	**Reference :** A IV TAWS bullet 30 & AMC1 ACNS.TAWS.1010

Current NPA text :
ETSO-C151b and ETSO-C92c (for the GPWS functions) requirements have been taken into account for equipment approval.
The Class A or Class B TAWS equipment should be approved in accordance with ETSO-C151b and ETSO-C92c (for the GPWS functions).
Thales concern :
This NPA makes a reference to ETSO-C92c. It should be recognized that ETSO-C92c has been superseded by ETSO C151B, since the TAWS definition as contained within ETSO-C151B not only encompasses the Predictive Terrain Alerting functions, but also "basic GPWS" modes/functions.
Furthermore it should also be remembered that TAWS Predictive Terrain Alerting functions have been designed to alleviate for the well-known limitations of "basic GPWS" modes/functions (lack of alerting, too late alerting or conversely nuisance alerting) with regard to safety (CFIT avoidance).
Rationale for action :
Future regulation should not enforce to rely on those "low-performances" GPWS modes which have not only been completed but mainly superseded by the Predictive Terrain Alerting functions..
Action & rewording proposal:
Therefore such new regulation should not refer anymore to any ETSO-C92xxx as such.

response | *Accepted*

Reference to ETSO-C92c to be deleted from the AMC. The reference to ETSO-C92C in the explanatory note will not be modified as it is not part of the published CS-ACNS.

comment | *34*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P7	**Reference :** A IV TAWS bullet 28

Current NPA text :
The standards as defined in JAA TGL 12 have been transposed, updated and captured the Certification Specification proposed by this NPA within the CS ACNS.TAWS section.

Thales concern & Rationale for action :
As expressed in this NPA, JAA TGL 12 requirements have not only been transposed but also updated.
Concern is that those updates with regard to existing TGL 12 or ETSO-C151B are not explicitly presented in this NPA.
In addition as the TGL 12 requirements have been transposed with significant changes in the document structure and the wording in each section, it is therefore difficult :
1) to ensure that the TAWS requirements are the same as those of TGL 12
2) to identify changes in TAWS requirements resulting from specific updates

Action & rewording proposal:
It is recommended to :
1) replicate word by word TGL-12 with the same structure and the same wording (while suppressing - with clear indications - all duplication with existing ETSO-C151B)
2) clearly identify additional and/or modified TAWS requirements.

response | *Not accepted*

Replicating word by word of JAA TGL-12 and its structure is not possible as the Agency is transitioning from the TGL/AMC approach to that of Certification Specification. It would, therefore, be impracticable to maintain the existing format as it would be inconsistent with the new CS ACNS document.

comment | *35*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P7	**Reference :** A IV TAWS bullet 28

Current NPA text :
The standards as defined in JAA TGL 12 have been transposed, updated and captured the Certification Specification proposed by this NPA within the CS ACNS.TAWS section.

Thales concern & Rationale for action :
Though updates have been introduced in this NPA with regard to existing TAWS requirements, this NPA does not take the opportunity to address several safety enhancements, which are already in operation, with regard to existing ETSO C151B requirements. Among those safety enhancements, regulation guidance should address consideration to :
- updated requirements for GPWS basic modes (DO 161A in-depth update)
- appropriate desensitization of basic GPWS modes 1 and/or 2 when the Terrain predictive function is operative, in order to alleviate the previous well-known operational drawbacks of those modes
- specific turning flight (as well as non-level flight) requirements for predictive terrain alerting
- introduction of an additional warning for predictive terrain alerting dedicated for CFIT situations where a straight Pull Up maneuver will not be sufficient to clear the hazardous terrain
- landing operations minimum requirements for predictive terrain alerting in terms of runway proximity and height
- low RNP operations, since current ETSO C151B requirements are tailored for normal RNP operations and not for those with Authorization Required (RNP AR)
- display rendering harmonization for both absolute and hazardous terrain display

Action & rewording proposal:
If it is the intention within the CS ACNS.TAWS section to go further than a transposition of TGL 12, it is therefore recommended to address consideration to the previous points.

response	*Noted*
	The standards as defined in JAA TGL 12 have been transposed and where needed updated to address the safety recommendations stemming from the 'report on the accident to AIRBUS A-320-231, G-MEDA on approach to ADDIS ABEBA Airport Ethiopia – 31 March 2003'. It is not the intention to introduce additional requirements.

comment	*123*	comment by: *Garmin International*
	Regarding "Terrain Awareness Warning System (TAWS)":	
	Editorial: The following is a sentence fragment and should be corrected: "the proposed Certification Specification has been extended its scope to cover Class B equipment installations."	
response	*Noted*	
	The Agency acknowledges the editorial error in the Explanatory Note.	

A. Explanatory Note - IV. Content of the draft Decision - Reduced Vertical Separation Minima (RVSM)	p. 8

comment	*11*	comment by: *Bombardier Aerospace*

From the perspective of a systems integrator, we support the proposed RVSM standards as written.

response	*Noted*

The Agency thanks you for your support.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART A	p. 12-14

comment	*1*	comment by: *DFS Deutsche Flugsicherung GmbH*

As a general comment to the CS we would like to remark:
The existence of the EN 303 214 "Data Link Services (DLS) System; Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004; Requirements for ground constituents and system testing" is not reflected in the document. As interoperability is the objective to be aimed at with these additional specifications in the CS and AMC material, it could be expected to identify interfaces or at least common test scenarios thereof.

response	*Partially accepted*

The reference EN is only applicable to the demonstration of compliance for ground based systems. To provide actual evidence, these interface tests should be undertaken with a ground system to be declared in compliance with the EN, However, to be complaint with the EN, the ground system need to verified on the basis of real tests with a certified aircraft. Thus to ensure that circular requirement was not published reference to the EN has not been included.
Such interface testing using real ground systems could be proposed by the applicants but are not mandatory; it is up to the applicant to define its own process to demonstrate conformity with the CS ACNS.. It is proposed to identify a new AMC (AMC2 ACNS.DLS.B1.2000 Datalink Services) describing tests with verified ground system / ground system simulator. The test scenarios described in Community Specification EN 303 214 'Data Link Services (DLS) System' will be referenced, in a note, as a source of test scenarios

comment	*70*	comment by: *AIRBUS*

<u>Page / paragraph:</u> Page 13 - Book 1 - Subpart A - General - CS ACNS.GEN.1010 Definitions
<u>Comment / Proposed text:</u> Please add the following acronyms:
'ATS Communications Management (**ACM)** service'
'ATS CLearance and Information **(ACL)** service'
'ATS Microphone Check **(AMC)** service'
'Data Link Communications Initiation Capability **(DLIC)**'
<u>Rationale / reasons for comments:</u> Please add these acronyms in order to be consistent with some other definitions (e.g. CFIT, FLTA …)

response	*Accepted*

The text has been amended.

comment	75	comment by: *AIRBUS*

Page / paragraph: Page 13 - Book 1 - Subpart A - General - CS ACNS.GEN.1010 Definitions

Comment / Proposed text: Please modify the sentence on 'ATS Microphone Check service' by:

'ATS Microphone Check **(AMC)** service' means a service that provides air traffic controllers with the ca-pability to send an instruction to **one or** several data link equipped aircraft, at the same time, in order to in-struct flight crew**(s)** to verify that **his(their)** voice communication equipment is not blocking a given voice channel.

Rationale / reasons for comments: AMC service is used to address uplink message to one or several flight crews.

response	*Accepted*

The text has been amended.

comment	80	comment by: *AIRBUS*

Page / paragraph: Page 13 - Book 1 - Subpart A - General - CS ACNS.GEN.1010 Definitions

Comment / Proposed text: In the 'CPLDLC' definition, replace 'Controller-Pilot Communications' by 'Controller-Pilot **Direct** Communications'.

Rationale / reasons for comments: CPDLC means 'Controller-Pilot Direct Communication'.

response	*Partially accepted*

CPDLC stands for 'Controller-Pilot Data Link Communications', the definition has been amended accordingly.

comment	81	comment by: *AIRBUS*

Page / paragraph: Page 13 - Book 1 - Subpart A - General - CS ACNS.GEN.1010 Definitions

Comment / Proposed text: Please add the definition of ATN B1 & FANS 1/A CPDLC applications and clarify the applicable design standards for both applications.

Rationale / reasons for comments: ATN B1 & FANS 1/A acronyms are used in Section 2 – Data Link Services, but not defined in the document.

response	*Partially accepted*

The definitions of 'ATN B1' and 'FANS 1/A' have been added in the definitions, for the applicable standards are referenced in the appropriate sections.

comment	124	comment by: *Garmin International*

Regarding Definition of "Static Source Error (SSE)":

Editorial: The following line needs a page break before it as it included in the "'Required Terrain Clearance (RTC)'" definition: "'Static Source Error (SSE)' is the difference between the pressure sensed by the static system at the static port and the undisturbed ambient pressure."

response	*Accepted*
	Editorial error has been corrected as proposed.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 1 – VOICE CHANNEL SPACING (VCS) - System performance requirements — p. 15

comment	*58* comment by: *skyguide Corporate Regulation Management*
	CS ACNS.VCS.3000 **Performance Requirements** The voice communication systems conforms to the performance requirements of the following sections of ICAO Annex 10, Volume III, Part 2 (Second Edition — July 2007 incorporating Amendment No 85) Chapter 2 'Aeronautical Mobile Service': (a) Section 2.1 'Air-ground VHF communication system characteristics'. ~~(b) Section 2.2 'System characteristics of the ground installations' of ICAO.~~ (c) Section 2.3.1 'Transmitting function'. (d) Section 2.3.2 'Receiving function' excluding sub-section 2.3.2.8 'VDL — Interference Immunity Performance'. **Comment** not applicable for airborne equipment and shall therefore be removed
response	*Accepted*
	The text has been amended as proposed.

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comment	*71* comment by: *Eurocopter*
	Requirement CS.ACNS.AC.3020 Typo error : "*CS.ACNS.AC.3020*" should probably be "*CS.ACNS.VCS.3020*"
response	*Accepted*
	The text has been amended as proposed.

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comment	*82* comment by: *AIRBUS*
	<u>Page / paragraph:</u> Page 15 - Book 1 - Subpart B – Communications - Section 1 - Voice Channel Spacing CS ACNS.VCS.3010 Integrity & CS ACNS.VCS.3020 Continuity <u>Comment / Proposed text:</u> ACNS.VCS.3010 Integrity. Please replace 'The voice communication systems are designed commensurate with a major failure condition' by 'The voice communication systems is designed commensurate with a major failure condition' CS ACNS.VCS.30 20 Continuity. Please replace 'The probability of the loss of voice communication is better than or equal to remote' by 'The probability of the loss of the voice communication system is better than or equal to remote' <u>Rationale / reasons for comments:</u> Integrity & continuity requirements defined in CS ACNS.VCS.3010 & CS ACNS.VCS.30 20 are applicable at aircraft level, and not at equipment level. ACNS.VCS.3010 & CS ACNS.VCS.3020 should be clarified.
response	*Partially accepted*
	It is proposed to use the term 'Voice Communication System' (singular) everywhere as there is only one airborne Voice Communication System on board the aircraft, some equipment of which may be redundant to meet regulatory

requirement.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - General

p. 16

| comment | *83* | comment by: *AIRBUS* |

Page / paragraph: Page 16 - Page 1- Book 1 – Subpart B – Communications - Section 2 – Data Link Services (DLS) - CS ACNS.DLS.B1.1000 Applicability
Comment / Proposed text: Please add a dedicated disclaimer explaining that an aircraft installation already certified as compliant with EC Regulation N°29/2009 is de facto compliant with the proposed new CS ACNS.
Rationale / reasons for comments: Approved installation shall not have to be reassessed in regards with the proposed new CS ACNS.

response | *Not accepted*

CS-ACNS is not a rule and as such cannot impose requirements, it is only applicable to new applications, therefore, the proposed change is not necessary. If the application of CS-ACNS is deemed necessary to be applied to already certified aircraft additional regulatory action will be required.
This was already explained in the brochure 'Guidance to Applicants Data Link Services Airworthiness and Conformance to Commission Regulation (EC) No 29/2009' (see http://www.eurocontrol.int/sites/default/files/content/documents/nm/link2000/link2000-brochure-datalink-airworthiness-compliance.pdf) jointly published by European Commission, EASA and EUROCONTROL in June 2010 already approved installation will not need to be re-certified against CS ACNS.DLS.

| comment | *84* | comment by: *AIRBUS* |

Page / paragraph: Page 16 - Page 1- Book 1 – Subpart B – Communications - Section 2 – Data Link Services (DLS) - CS ACNS.DLS.B1.1000 Applicability
Comment / Proposed text: Please add a note to clarify the scope of CS ACNS regarding FANS 1/A applications. Clarify that the CS ACNS does not address FANS 1/A applications' airworthiness standards, but only defines airworthiness requirements related to the flight deck control & indications capabilities for aircraft equipped with a dual stack installation.
Rationale / reasons for comments: Several references with FANS 1/A applications are made in Book 1 Section 2 (& related Book 2 Section 2). FANS 1/A applications & related airworthiness standards are not defined. This may induce confusion to the reader.

response | *Not accepted*

CS ACNS.DLS.B1.1000 is clear, section 2 is only applicable to ATN B1 over VDL Mode 2 systems. The Agency is aware that a number of aircraft are required to interface with both an ATN B1 and FAN 1/A ground system. The limit of this proposal only to addresses the interface of theses system with the Flight Crew.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - Flight deck control and indication capabilities

p. 16

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comment	*14*	comment by: *Bombardier Aerospace*

"Dual stack" is not explicitly defined and should differentiate from "bilingual" systems for clarity, either here or in the associated AMC. Bilingual systems are dual stack systems that automatically select the data link network (FANS 1/A or ATN B1) in use. Dual stack system standards should also allow for systems that use manual selection of the data link network with an interlock feature to prevent simultaneous operation on both networks.

response	*Accepted*

A note has been added to AMC1.ACNC.DLS.B1.1011.

comment	*72*	comment by: *Eurocopter*

Requirement CS ACNS.DLS.B1.1010(a)(3)
Typo error: "*for the flight crew to know in real time the ~~identity~~ identifier of the ATS provider(s) connecting with the aircraft*"

response	*Accepted*

The text has been amended as proposed.

comment	*85*	comment by: *AIRBUS*

<u>Page / paragraph:</u> Page 16 – Book 1 – Subpart B – Communications - Section 2 – Data Link Services CS ACNS.DLS.B1.1010 Flight deck interface – (a)(2)
<u>Comment / Proposed text:</u> Please Replace '(2) for the flight crew to activate or deactivate the data link services;' by: '(2) for the flight crew **to initiate** the data link services;'
<u>Rationale / reasons for comments:</u> The wording 'activate/deactivate the data link services' has to be clarified, as it does not reflect the operational procedure & related interaction between the ground & the aircraft. AIRBUS proposes to use the wording 'initiate the data link services' instead of.

response	*Accepted*

The text has been amended as proposed.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - System performance requirements

p. 17

comment	*67*	comment by: *Dassault Aviation*

DASSAULT-AVIATION comment on § **CS ACNS.DLS.B1.3000 Integrity**
"The data link system is designed commensurate with a minor failure condition". From ED-120, Hazard H-ACL-12 "Undetected corruption of a message used for separation" may lead to misleading information and is classified 3, which commensurate with a major failure condition. What is the reason for change to minor failure condition ? Does the text only refers to data link system loss that is minor failure ?

response	*Accepted*

The comment is correct. Using ED-120 as the base the integrity should be commensurate with a major failure condition. The text has been amended to

	major.

comment	*73*	comment by: *Eurocopter*

Requirements CS ACNS.DLS.B1.3000 and CS ACNS.DLS.B1.3010
Should the following not be considered as major effects?
- Undetected corrupted message?
- Unexpected interruption of a CPDLC transaction?
- Undetected reception of an unexpected / misdirected message?
- Undetected out-of-sequence message?

response	*Noted*

1st, 3rd and 4th bullets are integrity issues and are addressed under the dedicated Integrity specification.
2nd bullet is continuity issue and is addressed under the dedicated Continuity specification.

comment	*86*	comment by: *AIRBUS*

Page / paragraph: Page 17 – Book 1 – Subpart B – Communications - Section 2 – Data Link Services - CS ACNS.DLS.B1.3000 Integrity
Comment / Proposed text: Please replace Replace 'The data link system is designed commensurate with a minor failure condition' by 'The data link system is designed commensurate with a **major** failure condition'
Rationale / reasons for comments: Proposed classification is not in line with the classification published in ED-120. The 'undetected corruption or misdirection' is classified as a 'Major' hazard

response	*Accepted*

The airborne DLS system integrity is designed commensurate with a major failure condition (as per ED-120).

B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - Time	p. 17

comment	*2*	comment by: *DFS Deutsche Flugsicherung GmbH*

Currently problems with synchronisation exist. The AMC on page 37 should specify as well the accuracy of the time and maximum deviations allowed. Use e.g. chapter 3.3.4 for message latency of EUROCAE ED-110B Vol I.

response	*Not accepted*

The AMC specified on page 37 (AMC1 ACNS.DLS.B1.3101) GNSS sensor is providing an accuracy vs. UTC better than 340 ns in 95% of the time (for GPS cf. DO-229D) whereas ICAO Annex 2 (Aircraft) specify an accuracy to UTC better than 1 s. However, a guaranteed accuracy, in all cases, cannot be provided by an equipment, so the acceptable means of compliance is to be connected to a GNSS sensor as time source.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART B - SECTION 2 - DATA LINK SERVICES (DLS) - CPDLC Messages	p. 18-21

comment	*3*	comment by: *DFS Deutsche Flugsicherung GmbH*

This comment for CS ACNS.DLS.B1.3301 and 3302 up- and downlink:
There is discrepancy between the required messages for ground systems and for aircraft systems:
The following messages are mandatory according to the DLS Community Specification for ground systems (EN 303 214):
DM 65: DUE TO WEATHER
DM 9: REQUEST CLIMB TO [level]
DM 10: REQUEST DESCENT TO [level]
and
DM 27: REQUEST WEATHER DEVIATION TO [specifiedDistanc] [direction] OF ROUTE
is optional.
They are not subject to this specification. This will not harm interoperability but seems to be not consistently agreed between stakeholders. See further comment on the related AMCs.

response	*Partially accepted*

Downlink message DM 65 has been added.
For the other messages, a requirement for a ground system to support (receive) a downlink message does not translates into a requirement for airborne implementations to provide support (send) these messages. In addition, DM9, DM10 and 27 are unambiguously marked as 'OPTIONAL' (thus also justifying the mandatory support upon receipt by ground implementations).

comment	*17*	comment by: *THALES AVIONICS*

DataLink	Pages: P20 & P40	Reference : CS ACNS.DLS.B1.3302 - Messages Table (Page 20) & GM1 ACNS.DLS.B1.3302 - Downlink messages Table (Page 40) & GM3 ACNS.DLS.B1.3302 - optional ACL downlink messages (Page 41)

Current NPA text :
DM9 : REQUEST CLIMB TO [level] o8
DM10 : REQUEST DESCENT TO [level] o8
DM27 : REQUEST WEATHER DEVIATION UP TO [specified Distance] [direction] OF ROUTE O8
Thales concern & Rationale for action :
NPA presents a potential discrepancy between those Tables for optional DM9, DM10, DM11 downlink messages
Action & rewording proposal:
It is suggested to
Suppress reference to those optional DM9, DM10, DM11 downlink messages in GM1 ACNS.DLS.B1.3302 - Downlink messages Table (Page 40)

response	*Accepted*

The text has been amended.

comment	30	comment by: *THALES AVIONICS*

DataLink	**Pages:** P20 & P40	**Reference :** CS ACNS.DLS.B1.3302 - Messages Table (Page 20) & GM1 ACNS.DLS.B1.3302 - Downlink messages Table (Page 40)

Current NPA text :
Not mentioned in current NPA text : DM18, DM65
Thales concern & Rationale for action :
Both tables in this NPA are not aligned with former Eurocontrol Specs Table A-4 for DM18 and DM65 downlink messages, which is currently used up to now by Ground Systems.
Action & rewording proposal:
It is therefore recommended to add a note to express the fact that those messages are no longer required to be downlinked by aircraft.

response	*Not accepted*

DM 18 and DM 65 have been added, they were excluded in error.

comment	64	comment by: *Dassault Aviation*

DASSAULT-AVIATION comment on § **CS ACNS.DLS.B1.3301 CPDLC Uplink Messages**
Compared to ED-120 change 2 Table 5-55 UM 135 is not required. What is the rational for change ?

response	*Not accepted*

For European continental airspace, transfer instructions (ACM service) are compliant with ED-110B 'Case A', in which they are passed without concatenation of UM135 CONFIRM ASSIGNED LEVEL message (see also EUROCONTROL Specification on Data Link Service v2.1)

comment	65	comment by: *Dassault Aviation*

DASSAULT-AVIATION comment on § **CS ACNS.DLS.B1.3302 CPDLC Downlink Messages**
Compared to Eurocontrol Specifications on DLS (ES-0116) §A.2.3.8, DM 18 and DM 65 are not required by CS. Compared to ED-120 change 2 Table 5-55, DM 38 is not required. What is the rational for change ?

response	*Partially accepted*

DM 18 and DM 65 have been added, they were excluded in error..
DM38 ASSIGNED LEVEL is generated in response to an UM135 (not mandatory), see response to comment 64.

comment	87	comment by: *AIRBUS*

Page / paragraph: Page 19 – Book 1 – Subpart B – Communications - Section 2 – Data Link Services - CS ACNS.DLS.B1.3301 CPDLC Uplink Messages
Comment / Proposed text: Please remove UM160 and UM227 from the table and create a new table for UM160 and UM227 with the introductive sentence:
"The data link system is capable of receiving and processing and displaying the following message elements:"
Rationale / reasons for comments: The proposed list of CS ACNS.DLS.B1.3301 CPDLC Uplink Messages includes technical & operational messages. Technical messages may not have to be displayed to the flight crew, because there is no operational need behind. It is the case of UM160 (NDA) & UM227 (LOGICAL ACKOWLEDGEMENT).

response	*Partially accepted*

The table has been amended as proposed, but with introductory sentence: 'The data link system is capable of receiving and processing the following message elements', as it is acknowledged that these messages do need to be displayed.

comment	89	comment by: *AIRBUS*

Page / paragraph: Page 20 – Book 1 – Subpart B – Communications - Section 2 – Data Link Services - CS ACNS.DLS.B1.3302 CPDLC Downlink Messages
Comment / Proposed text: Please add the DM9, DM10 and DM27 in the table.
Rationale / reasons for comments: These 3 DM that may be sent by the datalink system are missing in the proposed table. To be consistent with the GM3 ACNS.DLS.B1.3302.

response	*Not accepted*

CS ACNS.DLS.B1.3302 provides the list of all mandatory DMs. CS ACNS.DLS.B1.3302 references GM3 ACNS.DLS.B1.3302 (and to a lesser extent GM1 ACNS.DLS.B1.3302) that clarifies that DM9, DM10 and DM27 are OPTIONAL messages.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS) - General   p. 23

comment	91	comment by: *AIRBUS*

Page / paragraph: Page 23 - Book 1 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) - CS ACNS.TAWS.1000 Applicability
Comment / Proposed text: EASA is requested to clarify that aircraft installation demonstrated as compliant with the TGL 12 will not have to be reassessed. Moreover, EASA should clarify when these materials are applicable.
Rationale / reasons for comments: A significant number of requirements have been added and/or modified compared to TGL 12, impacting not only the TAWS function but also aircraft architecture.

response	*Noted*

CS-ACNS is not a rule and as such cannot impose requirements it is only applicable to new applications, thus aircraft (and changes) currently in compliance with JAA TGL 12 will not need to be reassessed. If the application of CS-ACNS is deemed necessary to be applied to already certified aircraft, additional regulatory action will be required.

comment	*125*	comment by: *Garmin International*

Regarding "Section 1 – Terrain Awareness Warning System (TAWS)":

Editorial: The title of ETSO-C151b (which is referenced on page 7) is "Terrain Awareness and Warning System". The references in this document are missing the word "and" (e.g."Terrain Awareness Warning System").
For consistency, this may want to be remedied throughout the document so as not to be in conflict with ETSO-C151b.

response	*Accepted*

Rewording to be done through the document and replacing 'Terrain Awareness Warning System' with 'Terrain Awareness and Warning System'.

comment	*126*	comment by: *Garmin International*

Regarding "CS ACNS.TAWS.1000 Applicability":

ETSO-C151b also defines a Class C TAWS. This section and others fail to mention Class C TAWS equipment in multiple occurrences throughout the document.
If it is the intention not to address Class C TAWS, then it should be stated within this document.

response	*Noted*

The applicability as stated in CS ACNS.TAWS.1000 is clear. CS-ACNS is only applicable to Class A and B systems, it is not the intention to address Class C TAWS systems in this document, therefore Class C is not mentioned.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS) - System functional requirements — p. 23-26

comment	*21*	comment by: *THALES AVIONICS*

TAWS	Pages: P23	Reference : System Functional requirements CS ACNS.TAWS.2010 Required functions

Thales concern & Rationale for action :
As already mentioned in the here above "general" comment, the function list does not replicate in the same manner the function list of ETSO-C151B. Moreover, with such rearrangement "GPWS functions" wording used in some other places of this NPA has lost its definition.
Additionally, it also include for a TAWS self-test function, which is a system function and not an operational function for safety protection. System function (which may be necessary to demonstrate system safety compliance with some system designs) should not be mixed with TAWS operational functions (i.e. Predictive Terrain and basic GPWS modes).
Additionally this list also contains a set of so-called "TAWS system functions" which relate to interfaces. System interfaces should not be mixed with operational TAWS functions.
Action & rewording proposal:
It is therefore recommended to :
A) if necessary, replicate the list of operational functions as listed within ETSO C151B
B) suppress "system function" from this list. A specific paragraph could be added to express that "a capability to initiate TAWS self-function on the ground could be provided is an acceptable means for demonstrating and ensuring compliance with required integrity requirements"
C) suppress "System interfaces" from this list, and develop a specific paragraph to address if any specific requirements relevant to system interfaces.

response | *Partially accepted*

A): The wording as already observed is consistent with ETSO C151B but is summarised within this CS. Therefore, no changes to the table are required .
B): Not accepted, this requirement is related to ensuring the correct TAWS functions have been embodied. It should be noted that the objective of the CS is to verify that the TAWS sub-system (i.e. meeting the ETSO C151B) when integrated within the aircraft is providing functions.
C): Accepted, the table will be split one part addressing the functions and one part addressing the interfaces.

comment | *36*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P24	**Reference :** CS ACNS.TAWS.2020 FLTA

Current NPA text :
Provide an FLTA function that:
(a) looks ahead of the aeroplane, within the search volume, which consists of a computed look ahead distance, a lateral distance on both sides of the aeroplane's flight path, and a specified look down distance based upon the aeroplane's vertical flight path. The lateral search volume expands as necessary to accommodate turning flight. The FLTA search volume is compatible with the accuracy of the TAWS navigation source;
(b) that gives timely alerts in the event terrain is predicted to penetrate the search volume;
(c) is available during all airborne phases of flight including turning flight;
(d) gives Required Terrain Clearance (RTC) alerts when the aeroplane is currently above the terrain in the aeroplane's projected flight path but the projected amount of terrain clearance is considered unsafe for the particular phase of flight

Thales concern & Rationale for action :
Definition of the FLTA function is far too much descriptive, going into design details. NPA requirements should focus on the expected outputs of such function. Additionally "look ahead distance " is a proprietary wording from one supplier..

Action & rewording proposal:
It is therefore recommended to replicate the existing wording from ETSO C151B §1.3 a, i.e. : "A Forward Looking Terrain Avoidance (FLTA) function. The FLTA function looks ahead of the airplane along and below the airplane's lateral and vertical flight path and provides suitable alerts if a potential CFIT threat exists"

response	*Accepted*

Text in bullets (a), (b), (c) to be deleted and replaced by ETSO-C151B wording as follows:

Provide an Forward Looking Terrain Avoidance (FLTA) function that looks ahead of the airplane along and below the airplane's lateral and vertical flight path and provides suitable alerts if a potential CFIT threat exists

Bullet (d) Required Terrain Clearance (RTC) and corresponding table to be kept as this is mentioned in ETSO C151B (3.1.1.), however the paragraph is reworded to to start.

'Provide a Required Terrain Clearance (RTC)....'

comment	*37*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P26	**Reference :** CS ACNS.TAWS.2060 aural and visual alerts (g)

Current NPA text :
(g) The alerting logic for 'Excessive Closure Rate to Terrain' and 'Flight Into Terrain When Not in Landing Configuration' provides sufficient time for the flight crew to react and take corrective action.
Thales concern & Rationale for action :
This requirement is specifically focused on basic GPWS Mode 2 and Mode 4, and seems awkward, since :
- "sufficient time for the flight crew to react and take corrective action" is a general statement that does not convey a defined requirement and could be applicable to every safety system
- further to basic GPWS Modes 2 and 4, this requirements could be applicable for all the other basic GPWS modes (e.g. Mode 1, Mode 3, Mode 5, bank angle alerting) as well as for predictive terrain alerting (FLTA, PDA).
Action & rewording proposal:
It is suggested to either refine this requirement for all the TAWS functions or to discard it.

response	*Accepted*
	Bullet (g) has been deleted from the text.

comment	*63* comment by: *General Aviation Manufacturers Association / Hennig*
	The table on Terrain Awareness **AND** Warning Systems (TAWS - note correct name from TSO/ETSO) system function (CS ACNS.TAWS.2010) contains references to functionality for TAWS Class A and TAWS Class B including (1) landing gear and flap position, (2) roll attitude input, and (3) interface to flight deck audio system.
	These are functionalities identified in TAWS Class A, but not Class B equipment according to ETSO-C151b. It is GAMA's understanding that this difference is specifically to address differences in airframe equipage (such as, gear and flap sensors not being available). Also, ETSO-C151b specifically states that TAWS Class B systems do not require an interface with external audio systems putting the proposed CS into conflict with the ETSO.
	Requiring TAWS Class B systems to have flap, gear, roll attitude or flight deck audio system inputs when an aircraft does not have that capability would likely prevent the installation of TAWS on many aircraft.
	GAMA recommends that the agency review the table in CS ACNS.TAWS.2010 rows 11, 12 and 13 to ensure that the proposed additional requirements for TAWS Class B systems does not impede the use of this safety enhancing equipment and, preferably, remove this proposed requirement.
response	*Accepted*
	Rewording and table corrections to be done in regard of TAWS Class B requirements.

comment	*94* comment by: *AIRBUS*

	Page / paragraph: Page 23 - Book 1 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) - CS ACNS.TAWS.2010 Required function and interfaces Comment / Proposed text: Please clarify CS ACNS.TAWS.2010 in order to authorize aircraft installation where the "TAWS alerting Voice callout function" is implemented in another aircraft system than the TAWS. Rationale / reasons for comments: CS ACNS.TAWS.2010 requires - at aircraft level - a Voice callout function "when descending through a predefined altitude above the runway threshold elevation for landing". Depending on aircraft architecture, this function can be supported by another aircraft system than the TAWS. On AIRBUS aircraft, the Flight Warning Computer (FWC) is implementing the "TAWS alerting Voice callout function".
response	*Noted* CS ACNS.TAWS.2010 requires that a voice callout is provided but does not specify that it must be a dedicated system thus a TAWS Voice callout may be part of an integrated flight deck architecture.

comment	*95*	comment by: *AIRBUS*
	Page / paragraph: Page 25 - Book 1 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) - CS ACNS.TAWS.2040 Class A TAWS inhibition Comment / Proposed text: Please explain the rationales for changing CS ACNS.TAWS.2040 (a) & (b) requirements. Rationale / reasons for comments: Rationale for change in applicable requirements (see requirements (a) & (b)) compared to former TGL 12 is not clear. TGL 12 only recommends "A means for the flight crew to inhibit the FLTA and PDA functions together with appropriate annunciation of the inhibited condition. Inhibiting FLTA and PDA should not impact the Basic GPWS functions". On current designs, manual inhibit capability inhibit both FLTA and PDA aural and visual alerts and terrain display. Moreover, some controls are used to deactivate independently some basic modes but do not inhibit all reactive modes (ex: Mode 5 can be inhibited with Glideslope inhibit control).	
response	*Accepted* The text has been amended to be consistent with the JAA TGL 12, bullet (a) and (b) to be replaced by following bullet (a), bullet (c) becomes (b): (a) the flight crew to inhibit the FLTA and PDA functions together with appropriate annunciation of the inhibited condition. Inhibiting FLTA and PDA should not impact the Basic GPWS functions".	

comment	*127*	comment by: *Garmin International*
	Regarding "Required Functions and Interfaces" - row 1 of the table on page 23 – voice callouts: The "With a 500 ft call out" is specified for Class B TAWS systems. ETSO-C151b also requires this same call out for Class A TAWS systems. Thus, by not specifying it for Class A TAWS, this document is in conflict with ETSO-C151b. To remedy the situation, it is suggested that the phrase "With a 500 ft call out" also be specified in the "Class A TAWS" column of row 1 of the table on page 23.	
response	*Accepted*	

The text has been amended.

| comment | *128* | comment by: *Garmin International* |

Regarding "Required Functions and Interfaces" - row 1 of the table on page 23 – voice callouts:

Regarding the statement "A Voice callout when descending through a predefined altitude above the runway threshold elevation for landing", this is only partially compliant with ETSO-C151b.

ETSO-C151b defines voice callouts as: "Voice callouts of altitude above the terrain shall be provided during non precision approaches per ETSO-C92c but are recommended for all approaches. These advisories are normally, but are not limited to 500 feet above the terrain or the height above the nearest runway threshold elevation."

Row 1 of the table on page 23 fails to specify "above the terrain" so is in conflict with ETSO-C151b. Suggest adding the phrase "above the terrain" to remedy the situation.

| response | *Accepted* |

Text amended to read:
'A Voice callout when descending through a predefined altitude above the terrain or nearest runway elevation'.

| comment | *130* | comment by: *Garmin International* |

Regarding "Required Functions and Interfaces" - row 11 of the table on page 24 – flight recorder:

An interface to a flight recording system is called out as a requirement. Nowhere in ETSO-C151b is this requirement established.
This is not in conflict with ETSO-C151b but is an additional requirement beyond the ETSO-C151b requirement set. It may be beneficial to all readers to specifically point out differences of this document and ETSO-C151b.

| response | *Partially accepted* |

An interface to a flight recording system is mentioned in JAA TGL 12 (Installation chapter bullet 6) as an Acceptable Means of Compliance. Reference is also made in the CS in Appendix 2: Example of an acceptable TAWS installation. A note will be added in AMC1 ACNS.TAWS.2010 with JAA TGL 12 text.

| comment | *131* | comment by: *Garmin International* |

Regarding "Required Functions and Interfaces" – row 14 of the table on page 24 – audio system:

An interface to flight deck audio system is called out as a requirement for Class B TAWS systems on row 14 of the table.
Nowhere in ETSO-C151b is this requirement established for Class B TAWS systems (it is for Class A TAWS systems). In fact, ETSO-C151b states "Class B Equipment does not require prioritization with external systems such as ACAS, RWS, PWS."

Thus, this document is in conflict with ETSO-C151b as this document specifically states that Class B TAWS systems must have an interface with external audio systems while ETSO-C151b specifically states that Class B TAWS systems do not require an interface with external audio systems.

Requiring aircraft that might install Class B TAWS systems to have an interface with external audio systems may prevent TAWS from being installed in many aircraft as they are simply not equipped with the necessary avionics to support it. This, in turn, adversely affects flight safety.

For these reasons, it is strongly suggested to remove the requirement for an interface to flight deck audio systems from the Class B TAWS column of row 14 of the table.

response	*Accepted*
	Table to be updated and requirement for Class B to be removed.

comment	*132*	comment by: *Garmin International*

Regarding CS ACNS.TAWS.2040 Class A TAWS inhibition:

This document makes the statement: "manual inhibit capability for FLTA aural alerts". What is noticeably missing is the "visual alert" aspect.

Because of this, this document is in conflict with ETSO-C151b as it states the manual inhibit shall inhibit the "FLTA function" (which is interpreted to include aural and visual alerts).

Therefore, it is suggested that the sentence **"manual inhibit capability for FLTA aural alerts, PDA aural and visual alerts and terrain display"** in this document be modified to state **"manual inhibit capability for the FLTA function, the PDA function and the terrain display"**.

response	*Partially accepted*
	The intent of this comment has been addressed in the response to comment 95.

comment	*134*	comment by: *Garmin International*

Regarding "Required Functions and Interfaces" – row 2 of the table on page 24 – glide slope and glide path:

Regarding the specification of "glide path" in the function "Excessive Downward Deviation from a glide slope or glide path", ETSO-C151b does not specify alerting on a glide path – only a glide slope.

This is not in conflict with ETSO-C151b but is an additional requirement beyond the ETSO-C151b requirement set. It may be beneficial to all readers to specifically point out differences of this document and ETSO-C151b.

response	*Noted*
	The text of JAA TGL 12 mentions glide path also the AMC to IR OPS on TAWS mode 5 for MLS, GLS LPV requirements use the term glide path and ETSO-C151b mentions glide slope. In order to keep consistency between TGL 12 and ETSO C151B both glide slope and glide path are included.

comment	*135*	comment by: *Garmin International*

Regarding CS ACNS.TAWS.2040 "Class A TAWS inhibition":

What of glide slope alert inhibiting as called out in RTCA/DO-161A (which is called out by ETSO-C151b)? Why is glide slope alert inhibiting not mentioned here?

response	Noted
	Although RTCA DO-161A may permit the Excessive Downward Deviation from Glide Slope to inhibited, such and inhabitation is not required by ETSO-C115b, appendix 1 Para 9.0 refers. The CS is in agreement with the ETSO.

comment	*136*	comment by: *Garmin International*
	Regarding CS ACNS.TAWS.2050 "Terrain information display" (c):	
	This document makes the following statement: "Terrain information can be selected or deselected." What exactly does this mean? Can additional information/guidance be provided?	

response	*Accepted*
	ETSO C151B has no provision for the system requirement related to the selection de-selection of terrain information thus bullet (c) has been deleted.

comment	*137*	comment by: *Garmin International*
	Regarding CS ACNS.TAWS.2060 "Aural and visual alerts":	
	Editorial: Missing period on the following sentence: "Each aural alert should identify the reason for the alert"	

response	*Accepted*
	The text has been amended.

comment	*138*	comment by: *Garmin International*
	Regarding CS ACNS.TAWS.2060 "Aural and visual alerts":	
	With regard to the following sentence "The alerting logic for 'Excessive Closure Rate to Terrain' and 'Flight Into Terrain When Not in Landing Configuration' provides sufficient time for the flight crew to react and take corrective action", what does the term "sufficient" really mean? What might be sufficient to one person might be insufficient to the next. Please be use non-vague definitions.	

response	*Noted*
	This comment has been addressed in response to comment 37.

comment	*144*	comment by: *Garmin International*
	Regarding Required Functions and Interfaces – row 12 of the table on page 24 – flap and gear inputs:	
	Row 12 calls out a requirement for an interface to landing gear and flap positions for Class B TAWS systems. Nowhere in ETSO-C151b is this requirement established for Class B TAWS systems (it is for Class A TAWS systems). In fact, it	

is our believe that it is intentionally not called out as the original TAWS authors realized the differences in airframe equipage and knew that some aircraft would not be equipped with gear and flap sensors – thus was born the multiple classes of TAWS.

While the specification of gear and flap inputs for Class B TAWS is not in conflict with any particular ETSO-C151b requirement, it is our belief that it is in conflict with the concept of multiple classes of TAWS that ETSO-C151b has outlined.

Requiring aircraft that might install Class B TAWS systems to have flap and gear inputs may prevent TAWS from being installed in many aircraft as they are simply not equipped with the necessary avionics to support it. This, in turn, adversely affects flight safety.

It is strongly suggested to remove the requirement of gear and flap inputs from the Class B TAWS column of row 12 of the table on page 24.

response	*Accepted*
	Requirement of gear and flap inputs for Class B TAWS has been deleted.

comment	*145* comment by: *Garmin International*
	Regarding Required Functions and Interfaces - row 12 of the table on page 24 – roll attitude input:
	Row 12 calls out that a roll attitude input is required for Class A and Class B TAWS systems.
	This is not in conflict with ETSO-C151b but is an additional requirement beyond the ETSO-C151b requirement set.
	It is our belief that a roll attitude input MAY be available for aircraft with Class A TAWS installations but it is unlikely to be available for many Class B TAWS installations.
	Requiring aircraft that might install Class B TAWS systems to have a roll attitude input may prevent TAWS from being installed in many aircraft as they are simply not equipped with the necessary avionics to support it. This, in turn, adversely affects flight safety.
	It is strongly suggested to remove the requirement of gear and flap inputs from the Class B TAWS column of row 12 of the table on page 24.
	Additionally, while a roll attitude input is specified as a requirement in this document, nowhere is it specified what to do with the input. Thus, this document is specifying an input with no use.
response	*Accepted*
	Requirement of roll attitude inputs for Class B TAWS is deleted. Concerning requirement for a roll attitude input, this is an Acceptable means of Compliance for Class A TAWS. There is no requirement for a roll attitude sensor for Class B.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN   p. 26

AWARENESS WARNING SYSTEM (TAWS) - Safety objectives

comment	*22*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P26	**Reference :** CS ACNS.TAWS.3000 Integrity c)

Current NPA text :
False and nuisance terrain alerting is designed commensurate with a major failure condition.
Thales concern & Rationale for action :
Though a safety target could be allocated to false alerts, it is not possible for nuisance alerts, since TAWS is a safety net . Level of nuisance alerting relates to system performance rather than integrity.
Action & rewording proposal:
It is recommended to remove here the wording "and nuisance".

response	*Accepted*

Bullet (c) to be changed to read:
(c) False terrain alerting is designed commensurate with a minor failure condition.

comment	*74*	comment by: *Eurocopter*

Requirement CS ACNS.TAWS.3000
CS ACNS.TAWS.3000(a) is included in a requirement named "Integrity", whereas it should probably be under a "Continuity" requirement.
(See also our general comment about the use of "Integrity" and "Continuity" for safety objectives)

response	*Accepted*

In Book 1 the requirement numbered 3000 addresses Integrity of the system (provision of incorrect information) whereas the requirement numbered 3010 will address continuity of the system (loss of function/data). Integrity will be specified in terms of failure condition whereas Continuity will be specified in terms of qualitative (and quantitative when necessary) probability.
The requirements will be reattributed to separate integrity and continuity requirements.

comment	*76*	comment by: *Eurocopter*

Requirement CS ACNS.TAWS.3000
Wording in CS ACNS.TAWS.3000 is not appropriate, especially:
- "*(a) Detected loss […] is designed commensurate* …": what is designed is the system, not the loss,
- Same type of remark for (b) and (c).
Suggestion:
"*The system shall be designed commensurate with the following failure*

classification objectives:
(a) Detected loss of the TAWS : minor,
(b) …"

response	*Partially accepted*
	The text has been modified to incorporate the intent of this comment and to reattributed the requirements to separate integrity and continuity requirements.

comment	*77*	comment by: *Eurocopter*

Requirement CS ACNS.TAWS.3000
Having the same classification for the lack of terrain alerting (item (b)) and for false alerts (item (c)) is highly questionable.

response	*Noted*
	The requirements are stems from JAA TGL 12, where both probability of false alerts and probability of nuisance alerts are qualified as minor failure conditions.

comment	*78*	comment by: *Eurocopter*

Requirement CS ACNS.TAWS.3000
The objective in (d) is not reachable: there is always a probability that a failure has an impact on an interfaced system. The system safety analysis shall take into account the interfaced systems in the fault trees.

response	*Accepted*
	Bullet (d) reworded to refer only to critical systems.

comment	*92*	comment by: *ACSS*

ACSS External Comment> CS ACNS.TAWS.3000 (b) and (c) appear to conflict with AC 25-23 Section 9 b) (2),(3),(4) which identifies 1.0 E-4 for the box installation (aircraft level) versus a major (1.0 E-5) failure rate per flight hour for the corresponding failures. Please clarify if the intent is to be consistent with AC 25-23.

Here's what AC 25-23 says:
b. The TSO-C151a requires a probability of 10-5 for unannunciated failure, hazardously misleading information (HMI), and false alerts at the box level. Therefore,
the box as installed must meet the following criteria:

(1) The probability of a failure that would lead to the loss of all functions as they are described in paragraph 6. (System Description) of this AC shall be less than or equal to 10-3 per flight hour.

(2) The probability of a false caution and/or warning alert due to undetected or latent failures shall be less than or equal to 10-4 per flight hour.

(3) The probability of an unannunciated failure of the system to provide the required alerting functions due to undetected or latent failures shall be less than or equal to 10-4 per flight hour.

	(4) The probability of the system to provide HMI to the TAWS display due to undetected or latent failures shall be less than or equal to 10-4 per flight hour.
response	*Noted* The stated failure conditions are compatible with the probability as stated in the comment CS ACNS.TAWS.3000 has to be read in conjunction with the definitions failure conditions, allowable qualitative probability, allowable quantitative probability and average probability per flight hour for the aircraft type (e.g Section 7 of AMC 25.1309 of CS 25).

comment	*96*	comment by: *AIRBUS*
	Page / paragraph: Page 26 - Book 1 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) Safety objectives - CS ACNS.TAWS.3000 Integrity Comment / Proposed text: Proposed CS ACNS significantly changes the safety objectives allocated to the TAWS function compared to TGL12. Rationales for change in applicable safety requirements compared to former TGL 12 would have to be clarified as it impacts not only the TAWS function but also aircraft architecture. Rationale / reasons for comments: TGL 12 safety requirements: *The probability of failure of the system to provide the required aural and visual alerting functions without a failure indication shall be shown to be no greater than 1 X 10 - 4 per flight hour.* *The probability of false alerts due to a failure of the system when no terrain hazard exists shall be shown to be no greater than 1 X 10 - 4 per flight hour* *Failure of the installed TAWS shall not degrade the integrity of any Essential or Critical system which has an interface with the TAWS.*	
response	*Noted* The rationale for change in applicable safety requirements compared to the former JAA TGL 12 have been to align with the major, minor definition that are applicable to the aircraft types See also responses to comment 92 and to more generic comment 69.	

comment	*119*	comment by: *AIRBUS*
	CS ACNS.TAWS.3000 Integrity The subparagraph (a), "*Detected loss of the TAWS is designed commensurate with a minor failure condition*" is part of a paragraph designated "Integrity" whereas this item should logically falls in the "Continuity" category.	
response	*Accepted* The requirement of CS ACNS.TAWS.3000 have been reattributed to separate integrity and continuity requirements.	

comment	*139*	comment by: *Garmin International*
	Regarding "CS ACNS.TAWS.3000 Integrity": Editorial: Missing period on the following sentence: "Detected loss of the TAWS is designed commensurate with a minor failure condition"	

response	*Accepted*
	The text has been amended.

comment	*140*	comment by: *Garmin International*
	Regarding "CS ACNS.TAWS.3000 Integrity":	

This document states "False and nuisance terrain alerting is designed commensurate with a major failure condition".
ETSO-C151b states: "A false terrain warning as a result of a TAWS computer failure is also considered a major failure condition. False sensor inputs (erroneous altitude, terrain data, airport data, etc) to the TAWS computer need not be considered for compliance to these failure condition classifications."
So while this document is not directly in conflict with ETSO-C151b, it does state unrealistic requirements which we believe the original TAWS authors recognized.
For is it possible to design a TAWS system that never has a false or nuisance alert? A TAWS system relies heavily on the Terrain Database. The quality of the Terrain Database, in turn, relies heavily on the data sources used to build it. In today's world, a fully accurate elevation map of the world does not exist. The maps have gotten better – but they all do still contain errors.
Given this, is the statement "False and nuisance terrain alerting is designed commensurate with a major failure condition" really appropriate or ever truly achievable in any TAWS system? We do not believe so.
Given this, it is suggested that the statement be reworded to be more in line with ETSO-C151b.

response	*Not accepted*
	Here the scope of the system is the aircraft, so it includes the TAWS equipment (ETSO C-151B) and the database and globally it is designed commensurate with a major failure condition. It makes sense here in the aircraft context whereas it does not makes senses at ETSO level where only the TAWS equipment is considered.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS) - System performance requirements   p. 26-27

comment	*23*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P27	**Reference :** CS ACNS.TAWS.4020 (a) (1)

Current NPA text :
the terrain information is automatically displayed when a TAWS caution alert occurs

Thales concern & Rationale for action :
The sentence should also address the fact that this requirement is also applicable when a warning alert is triggered since in some flight cases a warning alert could be raised without a preliminary caution alert.

Moreover, this requirement is only applicable with TAWS predictive terrain alerting (and not with basic GPWS modes alerting)

Action & rewording proposal:
It is therefore proposed to modify current wording as follows : " the terrain information is automatically displayed when either a predictive terrain caution or a predictive terrain warning alert occurs"

response | *Accepted*

The text has been amended.

comment | *38* comment by: *THALES AVIONICS*

TAWS	**Pages:** P27	**Reference :** CS ACNS.TAWS.3030 (c) & (d) - Positioning information

Current NPA text :
(c) When the TAWS positioning source is the same as the one used by the primary navigation system and provided that, applicable performance requirements are satisfied for navigation, a failure of the TAWS (including loss of electrical power to the TAWS) cannot degrade the primary navigation capability.
(d) When a positioning source generates a fault indication or any flag indicating the position is invalid or does not meet performance requirements, the TAWS is to stop utilizing that positioning source

Thales concern :
Those requirements refer to "applicable performance requirements … for navigation" and "position not meeting performance requirements".
As written here, those requirements generate very important concerns, as they convey significant inconsistencies between, on one hand the foreseen regulatory requirements and on the other hand with the fundamental intent of such systems, which are designed to be "Safety Nets" systems.

Rationale for action :
As "safety net" systems, design of TAWS must operate in such a way to protect the aircraft of CFIT in the broader situation cases, including not only flight errors but, above all, sensor errors or failures, and particularly positioning errors or failures.
As such, ideally a TAWS, being a safety net, would have to take a position information which is independent from the current aircraft sources used for navigating the aircraft. As this is not effectively possible, TAWS are mostly using the same positioning sources as those used for navigating the aircraft, but increasing the difficulty to protect from CFIT upon navigation source errors or failures.
Therefore, it should not be requested to deactivate TAWS protection upon navigation source errors or failures, but conversely to request to ensure continuous operation of TAWS protection even with degraded navigation sources (as far as different from the one used by the TAWS system) while ensuring still an acceptable level of protection (i.e. providing as far as possible "needed" alerts in CFIT situations) while with an alert nuisance rate still less than the maximum acceptable level.
It should be noticed that "position" encompasses both the horizontal as well as the vertical component of the aircraft position, with the recognition that a lateral position error is equivalent to a vertical error.

Action & rewording proposal:
Therefore it is recommended to modify those requirements as follows :
"(c) When the TAWS positioning source is the same as the one used by the primary navigation system and provided that, applicable performance requirements are satisfied for navigation, a failure of the TAWS (including loss of electrical power to the TAWS) must not degrade the primary navigation capability.
(d) When a horizontal or vertical positioning source generates a fault indication or any flag indicating its position is invalid or does not meet its performance requirements, the TAWS must mitigate the loss or the degradation of this positioning source by other means while still providing an acceptable level of detection of CFIT risks with a level of nuisance alerts less than a maximum acceptable level ".

response | *Partially accepted*

Bullet (c) has been changed as proposed with the exception that does replaces the word must.
The Changes to bullet (d) are not accepted. It is recognised that benefits would be achieved when operating in a degraded mode, it is, however, not possible to define an acceptable level of detection in such a degraded mode.

comment	97	comment by: *AIRBUS*

<u>Page / paragraph:</u> Page 27 - Book 1 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) Safety objectives - CS ACNS.TAWS.3030 (d) Positioning information
<u>Comment / Proposed text:</u> On current designs, when no GPS source is available on aircraft and the horizontal position source is degraded, 2 options are available for TAWS installed on Airbus aircraft:
- automatic inhibition of the TAWS function
- manual inhibition of the TAWS function (as per FCOM procedure)
EASA is requested to confirm the acceptability of these design solutions in regards with CS ACNS.TAWS.3030 (d).
<u>Rationale / reasons for comments:</u> Clarification of applicable requirement.

response	*Noted*

The requirement does not stipulate the manner in which the position source should be inhibited.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS) - Installation requirements

p. 27-28

comment	29	comment by: *THALES AVIONICS*

TAWS	**Pages:** P27	**Reference :** CS ACNS.TAWS.4000 (b) Failure mode

Current NPA text :
(b) The failure of the GPWS functions, except for power supply failure, input sensor failure, or failure of other common portions of the equipment, does not affect the FLTA function, PDA function, or Terrain Display and vice versa.
Thales concern & Rationale for action :
This requirement requests that the result of any function failure should not impact the operation of the other functions. However as written, its scope is significantly weakened as far as "other common portion of the equipment" may impact all those functions.
Additionally, such requirement should not be applicable to "positive" impacts, such as the des-inhibition of some inhibited functions (typically Basic GPWS Mode 1 or Mode 2) upon a predictive terrain function failure.
Action & rewording proposal:
Therefore it is suggested to rewrite this sentence as follows : "The failure of the GPWS functions, except for power supply failure, input sensor failure, or other failures external to the TAWS functions should not negatively alter the FLTA function, PDA function, or Terrain Display operation and vice versa".

response	*Partially accepted*
	Bullet (b) has been changed as proposed with the exception that does replaces the word 'must'.

comment	*93*	comment by: *ACSS*
	ACSS External Comment> CS ACNS.TAWS.4020 (b) implies that the pop-up is required (contradicts what is said in (a) above). Please clarify if (b) should be identified as sub-paragraph (6) under (a). TGL 12 identified that the popup was optional.	

response	Partially accepted
	Paragraph (b) has been deleted and the requirement to display the terrain information has been incorporated in paragraph (a) (1).

B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 2 – REDUCED VERTICAL SEPARATION MINIMUM (RVSM) - General

p. 29

comment	*27*	comment by: *THALES AVIONICS*

RVSM	**Pages:** P29	**Reference :** section 2 CS ACNS.RVSM.1010 RVSM system section a (4)

Current NPA text :
a (4) Static source error correction (SSEC), as required to meet the performance criteria as specified in CS-ACNS.RVSM 3010; and.

Thales concern & Rationale for action :
Performance criteria are described in requirement "CS ACNS.RVSM.3030 Altimetry system accuracy".
Requirement "CS ACNS.RVSM.3010 Continuity" deals with continuity.

Action & rewording proposal:
It is proposed to modify as follows : "a (4) Static source error correction (SSEC), as required to meet the performance criteria as specified in CS-ACNS.RVSM 3030; and"

response	*Accepted*
	The text has been amended.

comment	*98*	comment by: *AIRBUS*

<u>Page / paragraph:</u> Page 29 – Book 1 – Section 2 – reduced Vertical Separation Minimum (RVSM) - CS ACNS.RVSM.1000 Applicability
<u>Comment / Proposed text:</u> Please add a dedicated statement explaining that an aircraft installation already certified as compliant with JAA TGL6 is de facto compliant with the proposed new CS ACNS.
<u>Rationale / reasons for comments:</u> Approved installation shall not have to be reassessed in regards with the proposed new CS ACNS.

response	*Not accepted*

CS-ACNS is not a rule and as such cannot impose requirements it is only applicable to new applications, thus aircraft (and changes) currently in compliance with JAA TGL 10 will not need to be reassessed. If the application of CS-ACNS is deemed necessary to be applied to already certified aircraft additional regulatory action will be required.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 2 – REDUCED VERTICAL SEPARATION MINIMUM (RVSM) - Safety objectives   p. 30

comment	*79*	comment by: *Eurocopter*

Requirement CS ACNS.RVSM.3000
Typo error: "*Intergrity*"

response	*Accepted*

The text has been amended.

B. Draft Decision - CS–ACNS - Book 1 - SUBPART E - SECTION 2 – REDUCED VERTICAL SEPARATION MINIMUM (RVSM) - System performance requirements   p. 30

comment	*28*	comment by: *THALES AVIONICS*

RVSM	**Pages:** P30	**Reference :** section 2 CS ACNS.RVSM.3030 Altimetry system accuracy section c (2)

Current NPA text :

c (2) For all conditions in the full envelope: residual static source error +worst case avionics does not exceed 60 m (200 ft).

Thales concern & Rationale for action :

The full flight envelope is an envelope that is greater than basic envelope and includes it.

In requirement "CS ACNS.RVSM.3030 Altimetry system accuracy" section b, the performance described applies to the full flight envelope including the basic envelope, whereas in the section c (2), it applies only to the full envelope outside the basic envelope. This precision should be added to remove ambiguity between the two section..

Action & rewording proposal:

It is proposed to modify as follows : "c (2) For all conditions in the full envelope (outside the basic envelope): residual static source error +worst case avionics does not exceed 60 m (200 ft)."

response | *Accepted*

The text has been amended.

B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 – ATN B1 DATA LINK SERVICES - General   p. 32

comment | *60*   comment by: *THALES AVIONICS*

Datalink	Pages: P32	Reference : Section 2 / GM1.ACNS.DLS.B1.1000 Applicability

Current NPA text :

Installations intended to operate within EU Airspace defined in mentioned regulation, should fully comply with all requirements of 'DATA LINK SERVICES' section, in its entirety.

Thales concern & Rationale for action :

"In its entirety" will imply that also dual stack requirements are applicable, but these are not mandatory." Since FANS 1/A is not mandatory in EU airspace related to EC Regulation 29/2009, it is suggested to make more explicit the optional nature of FANS 1/A,

Action & rewording proposal:

It is proposed to modify as follows : " Installations intended to operate within EU Airspace defined in mentioned regulation, should fully comply in the entirety with all ATN B1 requirements of 'DATA LINK SERVICES' section. Additional dual stack and applications capabilities (i.e. FANS 1/A dual stacks with ATN B1) are not mandatory.".

response	*Not accepted*
	CS ACNS.DLS.B1.1000 is clear, section 2 is only applicable to ATN B1 over VDL Mode 2 systems. The Agency is aware that a number of aircraft are required to interface with both an ATN B1 and FAN 1/A ground system. The limit of this proposal only to addresses the interface of theses system with the Flight Crew.

comment	*66*	comment by: *Dassault Aviation*
	DASSAULT-AVIATION comment on § **GM1.ACNS.DLS.B1.1000 Applicability** : "Controller pilot communications through data link is used in different airspaces worldwide. Different technologies are used, and this CS is intended to provide the airworthiness standard for such installations". Is it anticipated that CS will be updated to take into account FANS 1/A and ARINC 623 ATS services (OCL, DCL, D-ATIS) for regulatory materials, integration constraints, specifities etc …	
response	*Noted*	
	The comment is correct. This CS will be updated as appropriate to address future European and Global Data link functions and technology.	

comment	*116*	comment by: *AIRBUS*
	GM1 ACNS.DLS.B1.1001 Data Link System Installation The element (k) quoted in the example is not relevant since it does not provide any interest from the operational standpoint. The element (k) should be deleted.	
response	*Accepted*	
	Bullet point (k) has been deleted.	

B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 –ATN B1 DATA LINK SERVICES - Flight Deck Control and Indication Capabilities   p. 33-35

comment	*18*		comment by: *THALES AVIONICS*

DataLink	**Pages:** P35	**Reference :** AMC1.ACNS.DLS.B1.1011 Dual Data Link Capabilities

Current NPA text :
FAA AC 20-140A provides adequate guidance related to the application interoperability, sub-networks and performance designators. (refer to Tables 5.1 and 5.2)

Thales concern & Rationale for action :
Though, as indicated in this NPA, FAA AC 20-140A provides adequate guidance, should the requirements contained in this guidance be applied when claiming conformity with AMC1.ACNS.DLS.B1.1011, and how to cope with potential discrepancies between the other guidance requirements of this NPA and those FAA guidance ?
Will compliance to future AC20-140B that will be developed for ATN B2 for the US NAS (National Airspace) need also to be considered ?

Action & rewording proposal:
It is proposed to modify as follows: "Note : FAA AC 20-140A provides adequate guidance related to the application interoperability, sub-networks and performance designators. (refer to Tables 5.1 and 5.2)
or even better : to explicitly extract from AC20-140A applicable MOC in order to ensure independence with FAA regulation while keeping harmonization.

response	*Partially accepted*
	AMC1.ACNS.DLS.B1.1011.(j) has been deleted from the list and has been transformed into a note as proposed.

comment	*99*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart B – Communications - Section 2 – ATN B1 data link services - Flight Deck Control and Indication Capabilities AMC1 ACNS.DLS.B1.1010 Flight Deck Interface
Comment / Proposed text: Please Modify AMC1 ACNS.DLS.B1.1010 as follows:
'If a direct interface exists between the data link application and other on board systems, (e.g. flight planning and navigation), a means ~~should~~ may be provided for the flight crew to initiate the use of the data contained in the message by the other on board system. The means provided should be separate from that used to respond to a message.'
Rationale / reasons for comments: The data link application /system may have an interface with another on board system, but the data integration might not be provided. The choice to implement or not further integration with other aircraft systems - when not requested by safety standards - shall be left to the aircraft manufacturer (considering operational needs, development costs ….).

response	*Accepted*
	The text has been amended.

comment	*100*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart B – Communications - Section 2 – ATN B1 data link services   Flight   Deck   Control   and   Indication   Capabilities   -

AMC1.ACNS.DLS.B1.1011 Dual Data Link Capabilities (Dual stack)

Comment / Proposed text: Please modify AMC1.ACNS.DLS.B1.1011 (g) as follows:
(g) Flight Deck Display of Messages from either FANS 1/A or ATN B1 CPDLC Applications.

A common flight deck display should be capable of displaying messages with the same operational intent resulting from same message elements that may be implemented differently between FANS 1/A and ATN B1 CPDLC applications. The common format to display FANS 1/A messages **may** be in accordance with the preferred format denoted in Annex A of ED 122, which is consistent with Doc 4444, 15th Ed, and ATN B1 message formats.

Or replace AMC1.ACNS.DLS.B1.1011 (g) by a guidance material.

Rationale / reasons for comments: The preferred format in ED122 and doc4444 are used as 'guidance' materials. It is up to the aircraft manufacturer - based on operational assessment - to define the detailed way to display each CPDLC message.

E.g. 1: some abbreviations can be used, in accordance with the cockpit philosophy and rules.

E.g. 2: the WG78/SC214 currently agreed to replace the wording STATE PREFERRED LEVEL by ADVISE PREFERRED LEVEL. This new kind of wording is currently submitted to OPLINKP for States Review and approval.

response	*Accepted*
	The text has been amended.

comment	*101*	comment by: *AIRBUS*
	Page / paragraph: Book 2 – Subpart B – Communications - Section 2 – ATN B1 data link services Flight Deck Control and Indication Capabilities - AMC1.ACNS.DLS.B1.1011 Dual Data Link Capabilities (Dual stack)	

Comment / Proposed text: Please modify (i)(4) requirement as follows:
" Ability for flight crew to manually terminate existing connection and establish new connection, initiate a DLIC 'logon' , in both directions (i.e., FANS 1/A-to-ATN B1 and ATN B1-to-FANS 1/A)".

Rationale / reasons for comments: The flight crew does not establish a connection.
The flight crew can only initiate a DLIC 'logon' (= initiate the use of datalink services)

response	*Accepted*
	The text has been amended.

B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 –ATN B1 DATA LINK SERVICES - ATN B1 Data link p. 35-37

comment	*102*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart B – Communications - Section 2 – ATN B1 data link services - Flight Deck Control and Indication Capabilities - GM1 ACNS.DLS.B1.2000 Data Link Services / (d) ATC Microphone Check (AMC) Service

Comment / Proposed text: Please modify GM1 ACNS.DLS.B1.2000 (d) as follows:
"The AMC service provides CPDLC ATC instructions to **flight crew(s)** requesting **him (them)** to verify the status of **his (their)** voice communication equipment"

Rationale / reasons for comments: The AMC service is used to address uplink

	message to one or several flight crews
response	*Accepted*
	The text has been amended.

comment	*103* comment by: *AIRBUS*
	<u>Page / paragraph:</u> Book 2 – Subpart B – Communications - Section 2 – ATN B1 Data link Services - ATN B1 Data link - GM3 ACNS.DLS.B1.2001 Protection mechanism
	<u>Comment / Proposed text:</u> Please modify GM3 ACNS.DLS.B1.2001 Protection mechanism as follows:
	'Further guidance material from EUROCONTROL is available at Link 2000+ Programme Websites:
	- http://www.eurocontrol.int/link2000/public/subsite_homepage/homepage.html.
	- http://www.eurocontrol.int/link2000/public/site_preferences/display_library_list_public.html.
	- LINK2000+/ATC DATA LINK OPERATIONAL GUIDANCE, Version ~~5.1~~6.0, Date: ~~01 March 2010.~~17 Dec 2012.
	- LINK 2000+ Guidance to Airborne Implementers, Version 1.1, Date: 09 December 2009.
	- LINK2000+/FLIGHT CREW DATA LINK OPERATIONAL GUIDANCE Version ~~4.0~~ 5.0, Date: ~~30 June 2009.~~ 17 Dec 2012.
	- LINK2000+ Programme, Generic Interop Test Plan for Avionics - Part 1, Upper Layers and CM/CPDLC applications, Version 2.3, Date: 15th June 2010.'
	<u>Rationale / reasons for comments:</u> New versions of documents referenced in this paragraph are available.
response	*Accepted*
	The text has been amended as proposed. In addition, the specific URL's will be deleted as it would be difficult to maintain them throughout the life of the CS ACNS, references will only be made to the generic EUROCONTROL website

B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 –ATN B1 DATA LINK SERVICES - CPDLC messages   p. 38-43

comment	*4* comment by: *DFS Deutsche Flugsicherung GmbH*
	For consistency reasons the first sentence should be changed to: The following table associates ~~uplink~~ downlink messages to the data link services.
response	*Accepted*
	The text has been amended.

comment	*5* comment by: *DFS Deutsche Flugsicherung GmbH*
	The sole listing of messages does not give a clue about their interdependency, the valid state relevant to the sender/recipient, which message needs to be answered by which message and possible combinations of or concatenated messages. Tables of ED110B Part 2,

	of "EUROCONTROL SPECIFICATION on Data Link Services" SPEC-0116 Table A-3, A-4 ff. or of EN 303 214 chapter 4.2.3 ff. are much more useful to this extent than this proposed list.
response	*Noted* The purpose of the CS-ACNS is not to replicate applicable standards, it just list the message that has to be implemented. Their interdependency is described in the referenced standards.

comment	*6*	comment by: *DFS Deutsche Flugsicherung GmbH*
	It is understood in the link 2000+ programme as agreement on Baseline 1 that only mandatory messages will be applied and that optional messages shall be implemented already (to prevent costly retrofitting) but only applied/activated at a later stage. It should be recommended to implement all optional messages and list them all, not only some.	
response	*Accepted* The following note has been added below the table of GM3 ACNS.DLS.B1.3302 to recommend the implementation of optional messages. Note: To prevent costly retrofitting, implementation of the above optional messages is highly recommended.	

comment	*104*	comment by: *AIRBUS*
	Page / paragraph: Page 38 – Book 2 – Subpart B – Communications - Section 2 – ATN B1 Data link Services - CPDLC messages - AMC1 ACNS.DLS.B1.3301 CPDLC Uplink Messages Comment / Proposed text: Please modify AMC1 ACNS.DLS.B1.3301 as follows: **"***Received uplink messages with response type 'A/N'or 'Y' as indicated in the 'Response' column should be responded with either DM4 (AFFIRM) or DM5 (NEGATIVE)."* Rationale / reasons for comments: The statement "Received uplink messages with response type 'A/N'or 'Y' as indicated in the 'Response' column should be responded with either DM4 (AFFIRM) or DM5 (NEGATIVE)" is not true for 'Y' messages. Downlink message elements allowed as response to an uplink with response type 'Y' are defined in ED110B, but are not DM4 (AFFIRM) or DM5 (NEGATIVE).	
response	*Accepted* Text amended	

comment	*105*	comment by: *AIRBUS*
	Page / paragraph: Page 38 – Book 2 – Subpart B – Communications - Section 2 – ATN B1 Data link Services - CPDLC messages - AMC1 ACNS.DLS.B1.3301 CPDLC Uplink Messages Comment / Proposed text: Please modify AMC1 ACNS.DLS.B1.3301 as follows: *'Received uplink messages with response type 'R' as indicated in the 'Response' column should be responded with DM3 (ROGER)* **or with DM1 (UNABLE).***'* Rationale / reasons for comments: The statement 'Received uplink messages with	

response type 'R' as indicated in the 'Response' column should be responded with DM3 (ROGER)" is not fully true.
For 'R' message, the DM1 UNABLE is also authorized.

response	*Accepted*
	The text has been amended.

comment	*106*	comment by: *AIRBUS*

Page / paragraph: Page 38 – Book 2 – Subpart B – Communications - Section 2 – ATN B1 Data link Services - CPDLC messages - AMC1 ACNS.DLS.B1.3301 CPDLC Uplink Messages
Comment / Proposed text: Please modify AMC2 ACNS.DLS.B1.3301 as follows:
"EUROCAE Document ED-110B requires (in Table 4-3, item 6a) aircraft to send the DM89 (MONITORING [unitname] [frequency]) CPDLC message upon receipt of a UM117 (CONTACT) or UM120 (MONITOR) CPDLC message. The sending of DM89 should be executed **could be manually prepared and sent by the flight crew** *in response to UM120 but not for UM117."*
Rationale / reasons for comments: DM89 is not sent automatically by the aircraft system on reception of the UM120 (MONITOR freq). DM89 could be operationally sent by the flight crew (by procedure) in response to the UM120 reception.

response	*Accepted*
	The text has been amended.

comment	*107*	comment by: *AIRBUS*

Page / paragraph: Page 40 – Book 2 – Subpart B – Communications - Section 2 – ATN B1 Data link Services - CPDLC messages - GM1 ACNS.DLS.B1.3301 Uplink Messages
Comment / Proposed text: Please modify UM237 status in GM1 ACNS.DLS.B1.3301 table as follows: remove 'AMC' and add 'ACM'
Rationale / reasons for comments: UM237 is not an "AMC category" uplink message, but an "ACM category" uplink message.

response	*Accepted*
	The text has been amended.

B. Draft Decision - CS–ACNS - Book 2 - SUBPART B - COMMUNICATIONS - SECTION 2 –ATN B1 DATA LINK SERVICES - Data link services requirements   p. 43-44

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comment	*108*	comment by: *AIRBUS*

Page / paragraph: Page 43 – Book 2 – Subpart B – Communications - Section 2 – ATN B1 Data link Services - CPDLC messages - AMC1 ACNS.DLS.B1.4101 Data Link Initiation Capability (DLIC) Service
Comment / Proposed text: Please modify AMC1 ACNS.DLS.B1.4101 (b) as follows:
'(b) The data link aircraft equipment DLIC contact function should comply with the aircraft system PR-DLIC-Cont-ETRCTP and PR-DLIC-Cont-TT performance values, respectively 6 *12 seconds and* 4 *8 seconds, as specified in EUROCAE Document ED-120 Table A-3.'*
Rationale / reasons for comments: The performance requirements for the DLIC-

contact application defined in ED120 table A-3 are 12 seconds for PR-DLIC-Cont-ETRCTP and 8 seconds for PR-DLIC-Cont-TT (not 6 seconds and 4 seconds)..

response	*Accepted*
	The text has been amended.

comment	*109*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart B – Communications - Section 2 – ATN B1 Data link Services
Data link services requirements
GM1 ACNS.DLS.B1.4101 Data Link Initiation Capability (DLIC) Service &
GM1 ACNS.DLS.B1.4201 ATC Communications Management (ACM) Service &
GM1 ACNS.DLS.B1.4301 ATC Clearances and Information (ACL) Service
Comment / Proposed text: Please modify GM1 ACNS.DLS.B1.4101, GM1 ACNS.DLS.B1.4201 & GM1 ACNS.DLS.B1.4301 as follows:
'*The Performance Tables in the main body of EUROCAE Document ED-120 for DLIC (Table **4-8 and table** 4-9), ACM (Table 5-21) and ACL (Table 5-31 **and in table 5-32**) provide the ~~required round-trip time (TRN) and the allocated values for the two-way transactions~~ **allocated values for the required transaction performances.'**
Rationale / reasons for comments: The 'TRN' parameter is not round-trip time. Round-trip time is not defined in ED120.
The allocated values for the required transaction performances are defined in ED-120:
- tables 4-8 & 4-9 for the DLIC application,
- table 5-21 for the ACM application,
- table 5-31 & 5-32 for the ACL application

response	*Accepted*
	GM1 ACNS.DLS.B1.4101, GM1 ACNS.DLS.B1.4201 & GM1 ACNS.DLS.B1.4301 have been modified as proposed.

B. Draft Decision - CS–ACNS - Book 2 - SUBPART E — OTHERS - SECTION 1 – TERRAIN AWARENESS WARNING SYSTEM (TAWS)   p. 48-55

comment	*24*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P46	**Reference :** AMC1 ACNS.TAWS.2010 c)

Current NPA text :
….. to meet the warning requirements described in RTCA Document No. DO-161A

Thales concern :
Here and in several other sections, this NPA still refers to RTCA DO-161A requirements, and Mode envelopes

Rationale for action :
But it should be recognized that RTCA DO-161A is a very old document, if not obsolete (dated May 1975). Current TAWS logics (e.g. mode envelopes, modes parameters) are no more fully compliant to the detailed requirements of this RTCA DO-161A document as current TAWS design embed numerous improvements to those initial requirements in order to improve the detection rate and alleviating nuisance alerts

Progress made on CFIT protection over the years resulting of operational exposure should be taken into account rather than coming back on outrun or obsolete requirements from the past DO161A (dated May 1975) which have proved to present so well-known insufficient performances that GPWS have been replaced by the new TAWS predictive terrain technology.

Action & rewording proposal:
One of the most important update that would be useful to be performed in a new regulation would be to update this RTCA DO161A document according to the logics of state-of-the-art designs.
At least, references to DO161A must be avoided.

response	*Not accepted*
	The reference to DO-161A is kept in AMC1 ACNS.TAWS.2010 (c) as this document is also referenced in ETSO-C151b for the same functionality.

comment	*39*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P46	**Reference :** AMC2 ACNS.TAWS.2010

Current NPA text :
In case of an intentional descent an awareness check at a predefined altitude (typically 500 ft.) should be provided by the TAWS or by an operational procedure
In case of an unintentional descent the TAWS should provide an automatic call out when descending through a predefined altitude (typically 500ft).
Thales concern & Rationale for action :
A TAWS system has no possibility to know if a descent is intentional or unintentional.
Additionally, with regard to "call-outs" , those advisories are provide with regard to a height above terrain or above the elevation of the nearest runway, but not with regard to an altitude
Action & rewording proposal:
Therefore it is suggested to rewrite those sentences as follows : "In case of descent the TAWS should provide an automatic call out when descending through a predefined height (typically 500ft above terrain or above the elevation of nearest runway"..

response | *Accepted*

The text has been amended as proposed.

comment | *40*　　　　　　　　　　　　　　　　　　　comment by: *THALES AVIONICS*

TAWS	**Pages:** P46	**Reference :** AMC1 ACNS.TAWS.2020 a)

Current NPA text :
The TAWS lateral search area should be less than the protected area defined by ICAO PANS OPS 8168, volume 2 to prevent nuisance alerts.
Thales concern & Rationale for action :
This requirement contains design considerations.
Action & rewording proposal:
Performance expectations in terms of nuisance alerting would be preferable than logics design requirements.

response | *Not accepted*

Within Book 2 design solutions that are considered as acceptable means of compliance are identified, performance expectation where appropriate will be defined in Book 1. Alternate designs may also be used by applicants provided that they support the statement of Book 1.

comment	*41*		comment by: *THALES AVIONICS*

TAWS	**Pages:** P47	**Reference :** AMC1 ACNS.TAWS.2050 b)

Current NPA text :
Terrain, obstacle and alerting information could be displayed on a weather radar, an Electronic Flight Instrument System display, or other compatible display system available on the flight deck. In this case, the TAWS information should be displayed in a manner consistent with other information (e.g. range, colour coding, symbology).

Thales concern & Rationale for action :
Obstacles are mentioned here. It should be recognized that obstacle alerting is not part of basic definition of TAWS.

Action & rewording proposal:
It is suggested to suppress the wording "obstacle" or to clarify that it is an optional feature

response	*Accepted*

Bullet (b) changed as proposed to delete the reference to obstacles and reworded to improve readability as follows:
(b) If terrain alerting information is displayed on a weather radar, an Electronic Flight Instrument System display, or other compatible display system available on the flight deck, then the TAWS information should be displayed in a manner consistent with other information (e.g. range, colour coding, symbology).

comment	*42*		comment by: *THALES AVIONICS*

TAWS	**Pages:** P47	**Reference :** AMC1 ACNS.TAWS.2060

Current NPA text :
Table 1 : Aural and visual alerts
Thales concern & Rationale for action :
The organization and content of this Table is not consistent with Table 4-1 Standard Set of Visual and Aural Alerts" of ETSO C151 B. Moreover, such list introduces some reference to DO-161A envelopes which are no more used in real flight operations for several years in current state-of-the-art TAWS. Progress made on CFIT protection over the years resulting of operational exposure should be taken into account rather than coming back on outrun or obsolete requirements from the past (DO161A dated May 1975) which have proved to present so well-known insufficient performances that GPWS have been replaced by the new TAWS predictive terrain technology.
Action & rewording proposal:
It is suggested to not replicate here this list already defined in ETSO C151B, but to limit the wording to just a reference to Table 4-1 Standard Set of Visual and Aural Alerts" of ETSO C151 B.

response	*Partially accepted*

Concerning the reference to DO-161A see response to comment 24.
The objective of the AMC is not to repeat ETSO C151B. The objective is to verify that when the TAWS equipment is integrated on board the aircraft the alerts (referenced in ETSO C151 B and any additional alerts) are provided visually or aurally. AMC1 ACNS.TAWS.2060 has been modified accordingly.

comment	*43*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P47	**Reference :** AMC1 ACNS.TAWS.2060

Current NPA text :
Table 1 : Aural and visual alerts
Thales concern & Rationale for action :
Though updates have been introduced in this NPA with regard to existing TAWS requirements, this Table fails to take the opportunity to introduce an additional warning dedicated for CFIT situations where a straight Pull Up maneuver (which is the recommended crew action today on a Pull Up warning) will not be sufficient to clear the hazardous terrain, therefore not appropriate to avoid that a collision will happen though a TAWS warning has been generated.
In Thales design, this additional warning is called "Avoid Terrain" and is triggered in situations where a straight Pull Up maneuver will not be sufficient to clear the hazardous terrain.
Action & rewording proposal:
As not being defined in current ETSO C151B, this additional warning should be required here.

response	*Partially accepted*
	To reflect the intent of this comment and to address other alerts introduced by other manufactures, reference has been added to state that any optional aural alerts should be tested as well.

comment	*44*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P50	**Reference :** AMC1 ACNS.TAWS.3020 Terrain and airport information

Current NPA text :
An airport and terrain database used by the TAWS should be compliant with EUROCAE ED-98 () – User Requirements for Terrain and Obstacle Data.

Thales concern & Rationale for action :
With regard to terrain data, ED-98() intent is to be applicable to data originator, as mentioned in ED-98() §1.4 applicability - "it is recognized that quality requirements derived from the system designer or the end user specifications may be equally applicable to the data originator", i.e. at the upstream level of the data chain process and not to the downstream part, for which EUROCAE ED76/RTCA DO200A are to be used.
Additionally, ED-98() does not address airport data requirements, which are addressed in EUROCAE ED-77 (RTCA DO 201A).

Action & rewording proposal:
It is proposed to modify this sentence as follows : "Terrain data used for the generation of the TAWS terrain database should be compliant with EUROCAE ED-98 () – User Requirements for Terrain and Obstacle Data. Similarly airport and runway data terrain used for the generation of the TAWS airport database should be compliant with EUROCAE ED-77 () – Standards for Aeronautical Information. Generation of the TAWS terrain database and of the TAWS airport database should be compliant with EUROCAE ED-76 () – Standards for Processing Aeronautical Information".

response	*Accepted*
	The text has been amended as proposed.

comment	*45*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P50	**Reference :** AMC1 ACNS.TAWS.3020 Terrain and airport information
Current NPA text : The manufacturer of the TAWS system should present the development and methodology used to validate and verify the terrain, obstacle and airport information in compliance with EUROCAE ED76/RTCA DO200A. **Thales concern & Rationale for action :** Obstacles are mentioned here. It should be recognized that obstacle alerting is not part of basic definition of TAWS. **Action & rewording proposal:** It is proposed to modify this sentence as follows : "The manufacturer of the TAWS system should present the development and methodology used to validate and verify terrain and airport information, and if relevant obstacles information in compliance with EUROCAE ED76/RTCA DO200A.."		

response | *Accepted*

The text has been amended as proposed.

comment | *46* | comment by: *THALES AVIONICS*

TAWS	**Pages:** P50	**Reference :** AMC1 ACNS.TAWS.3030 Positioning information (1), (2), (3)
Thales concern & Rationale for action : No comments on proposed requirements (1), (2) and (3) as far as those requirements on horizontal positioning applies to the installation in which the TAWS should be installed. If it is not the case, see our comments on "CS ACNS.TAWS.3030 (c) & (d) - Positioning information" on Page 27.		

response | *Noted*

comment | *47* | comment by: *THALES AVIONICS*

TAWS	**Pages:** P50	**Reference :** AMC1 ACNS.TAWS.3030 Positioning information (4)
Thales concern & Rationale for action : No comments on proposed requirements (4) as far as those requirements on vertical positioning applies to the installation in which the TAWS should be installed. If it is not the case, see our comments on "CS ACNS.TAWS.3030 (c) & (d) - Positioning information" on Page 27		

response	*Noted*

comment	*48*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P50	**Reference :** AMC1 ACNS.TAWS.3030 Positioning information (4)

Current NPA text :
Note: Designs that cross check barometric and geometric altitude are recommended

Thales concern :
This NPA refers to "geometric altitude" which is publicly not defined and moreover which refers to a proprietary logic from a competitor. Such "geometric altitude" wording must not be used in regulatory material.

Rationale for action :
It should be noticed that this note (which could not be considered as a requirement) is consistent with our previous comment on "CS ACNS.TAWS.3030 (c) & (d) - Positioning information" on Page 27 where it is proposed to require "d) When a horizontal or vertical positioning source generates a fault indication or any flag indicating its position is invalid or does not meet its performance requirements, the TAWS must mitigate the loss or the degradation of this positioning source by other means while still providing an acceptable level of detection of CFIT risks with a level of nuisance alerts less than a maximum acceptable level ".

Action & rewording proposal:
This note could be rewritten as a note or a dedicated requirements as follows : "TAWS should mitigate potential vertical positioning source inaccuracies by appropriate blending of available vertical position information, while still providing an acceptable level of detection of CFIT risks with a level of nuisance alerts less than a maximum acceptable level "

response	*Partially accepted*

It is recognised the term 'geometric altitude"' is publicly not defined the note has been amended as follows:
Note: TAWS should mitigate potential vertical positioning source inaccuracies by appropriate blending of available vertical position information.

comment	*49*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P51 & P52	**Reference :** AMC1 ACNS.TAWS.4010. Prioritization schemes

Current NPA text :
Table 2 - Alert prioritization scheme
Table 3 : TAWS internal alert prioritization scheme
Thales concern :
Those tables are identical to those of ETSO C151B.
Rationale for action :
In order to avoid potential discrepancies due to their duplication, it is recommended to limit the alert prioritization scheme by only a reference to the corresponding table of ETSO C151B.
Action & rewording proposal:
It is recommended to limit the alert prioritization scheme by only a reference to the corresponding table of ETSO C151B.

response | *Not accepted*

It is noted the CS contains similar and consistent requirements to those specified on the ETSO. However, the CS requirements are aircraft level requirements and not applicable to the equipment. As correctly identified that are full consistent and it is the Agency intent to update the ETSO accordingly.

comment | *50*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P52	**Reference :** AMC1 ACNS.TAWS.4020. Pop up mode

Current NPA text :
For dual displays, the pop-up function can be inhibited if terrain is already presented on at least one display.
If TAWS and the Predictive Windshear System share the same display and an automatic pop-up function is employed, the display priorities indicated in Table 4 are recommended
Thales concern & Rationale for action :
This NPA seems to require a pop-up mode which is not required at ETSO C151B level and remains an optional mode.
Action & rewording proposal:
It is proposed to modify as follows : "For dual displays installations, when an automatic pop-up mode is provided, the pop-up function may be inhibited , if terrain is already presented on at least one display.".

response | *Accepted*

The text has been amended as proposed.

comment	*61*	comment by: *Embraer - Indústria Brasileira de Aeronáutica - S.A.*

AMC1 ACNS.TAWS.3030: Positioning information
1) On subitem (a)(1), first bullet: the text lists ETSO-C129c, but this ETSO does not exist. It should list ETSO-C129a;
2) On subitem (a)(1), first bullet: there is a typing error. The text lists ETCO-C196a, but it should be ETSO-C196a;
3) On subitem (a)(1), second bullet: Embraer requests EASA to also consider systems previously approved per AC 20-130A (Cancelled by AC-138B);
4) On subitem (a)(4), fourth bullet: Embraer requests EASA to also consider GNSS systems approved per ETSO- C129a as an appropriate source for vertical position;

response	*Accepted*

The text has been amended as proposed.

comment	*110*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) - AMC1 ACNS.TAWS.1010 TAWS equipment approval
Comment / Proposed text: Please clarify the status of ETSO-C151b in regards with the FAA TSO-C151c
Rationale / reasons for comments: The FAA has published updated TSO-C151c in February 2012. Draft CS ACNS is requesting compliance with ETSO-C151b, which is not fully harmonized with the FAA TSO-C151c

response	*Noted*

Reference to ETSO C115B will be maintained as this currently the applicable European standard.

comment	*111*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) - AMC1 ACNS.TAWS.2010 (a) Required functions
Comment / Proposed text: Please Modify AMC1 ACNS.TAWS.2010 as follows:
'However, another altitude call out value may be allowed when a call-out at 500ft would interfere with other operations".
Rationale / reasons for comments: AIRBUS understands that the objective of AMC1 ACNS.TAWS.2010 (a) is to allow alternative call out value when the proposed 500ft is interfering with other operations.

response	*Accepted*

The text has been amended.

comment	*112*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) - AMC2 ACNS.TAWS.2010 (a) Required functions
Comment / Proposed text: Please clarify the interpretation of the terms:
- intentional descent
- unintentional descent
Rationale / reasons for comments: Clarification requested to properly understand

	the requirement.
response	*Noted* The intent of this comment has been addressed in response to comment 39.

comment	*113*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) - AMC1 ACNS.TAWS.2040 PDA function requirements
Comment / Proposed text: For AMC1 ACNS.TAWS.2040 (a), please clarify if the implementation of the "atlernate manual inhibit functionality" is a mandatory requirement or a recommendation. TAWS installed on Airbus aircraft are not fully compliant with CS ACNS.TAWS.2040 (See AIRBUS comment N°18).
AIRBUS understands that the implementation of an automatic inhibition functionality is no mandatory.
AIRBUS considers that a non guarded control is an acceptable alternate means of compliance to AMC1 ACNS.TAWS.2040 (c).
Rationale / reasons for comments: Rationales for change in applicable requirements compared to former TGL 12 is not well understood.

response	*Accepted* The note in AMC1 ACNS.TAWS.2040 (a) has been deleted. Implementation of automatic inhibition functionality is not mandatory. The capability of automatically inhibiting Class A functions within TAWS equipment is acceptable if it includes a failure monitor function that provides reliable indications of equipment condition during operation. It shall monitor the equipment itself, input power, input signals, and aural and visual outputs. A means shall be provided to inform the flight crew whenever the system has failed or can no longer perform the intended function. Also a non guarded control may be an acceptable alternate means of compliance to AMC1 ACNS.TAWS.2040 (c).

comment	*114*	comment by: *AIRBUS*

Page / paragraph: Book 2 – Subpart E – Others - Section 1 – Terrain Awareness Warning System (TAWS) - AMC1 ACNS.TAWS.4010 Prioritisation schemes
Comment / Proposed text: Table 2 priority list includes alerts that are beyond TAWS scope (functions not required to be performed by TAWS: ex: TCAS alerts, PWS alerts, ...). The purpose of this CS ACNS is to cover TAWS, thus it should only include alert priority for TAWS required function.
EASA is asked to clarify that the proposed table 2 has to be considered as recommendations. Alternate alert prioritization schemes could be acceptable.
Rationale / reasons for comments: for TAWS, some alerts are not repeated periodically but the inter message delay is dependent on the degradation of the situation (audio declutter feature). This is the case for the glideslope alert for instance.
Current design is not fully compliant to the proposed priority list (eg PWS caution are of higher priority than any TAWS alert).

response	*Noted* An AMC is an acceptable means of compliance and does not prevent the applicant form proposing alternatives.

comment	*141*	comment by: *Garmin International*

Regarding "Section 1 – Terrain Awareness Warning System (TAWS)":

On page 23 there starts a section named "Subpart E – Others / Section 1 – Terrain Awareness Warning System (TAWS)".
On page 48 there starts a section named "Subpart E – Others / Section 1 – Terrain Awareness Warning System (TAWS)".
So this document has two sections named exactly the same. Suggest rethinking this.
Additionally, why are there two separate sections for TAWS? Is there really a need for two separate sections of the same subject? If one section addresses certain aspects and the other section addresses different aspects of the same subject, why not make one section with two sub-sections? Having the same subject matter scattered through a document makes it extremely difficult for the reader. And please state what each section's intent is at the beginning of the section – that is not clearly done presently (e.g. Something like "The intent of this section is to state the compliance requirements of the TAWS system").

response	*Noted*

CS-ACNS book contains 2 Books: Book 1, which provides the certification specifications (i.e. the objective performance, functionality and interoperability standards) and Book 2, containing Acceptable Means of Compliance (AMC) and Guidance Material (GM). This structure was presented in NPA 2012-19 whereas this NPA as indicated in the explanatory note proposed an amendment to the previous NPA text.

comment	*142*	comment by: *Garmin International*

Regarding "AMC1 ACNS.TAWS.2010 Required functions – (a)":

Editorial: Missing period on the following sentence: "However, another altitude may be allowed when a call-out at 500 ft. would interfere with other call outs"

response	*Accepted*

Text amended

B. Draft Decision - CS–ACNS - Book 2 - SUBPART E — OTHERS - SECTION 1 - APPENDIX 1: TAWS INSTALLATIONS TESTING GUIDANCE MATERIAL p. 56-57

comment	*26*	comment by: *THALES AVIONICS*

TAWS	**Pages:** P53	**Reference :** general testing (b)

Current NPA text :
(b) The use of the TAWS as an integrated part of the aeroplane flight deck should be demonstrated. The TAWS should be shown to be compatible with the operation of the installed navigation systems including paper charts, the airborne collision and avoidance system (ACAS), the windshear warning system, and the weather radar.
Thales concern & Rationale for action :
This requirements refers to "paper charts", moreover in a very open way. Compliance with paper is not feasible with electronic systems.
Action & rewording proposal:
It is therefore recommended to suppress "paper charts" in this requirement as follows : " (b) The use of the TAWS as an integrated part of the aeroplane flight deck should be demonstrated. The TAWS should be shown to be compatible with the operation of the installed navigation systems, the airborne collision and avoidance system (ACAS), the windshear warning system, and the weather radar".

response | *Accepted*

The text has been amended as proposed.

comment | *51*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P53	**Reference :** general testing (d)

Current NPA text :
(d) Flight testing should be carried out to evaluate overall operation, compatibility between TAWS, warning systems, navigation systems, and displays, freedom from unwanted interference, and to assess, during adverse flight conditions, instrument visibility, display lighting, sound levels and intelligibility of voice announcements, and the effects of electrical transients.
Thales concern & rewording proposal:
a) A clarification is proposed by changing "compatibility between TAWS, warning systems" with "compatibility of TAWS with warning systems"
b) "instrument visibility and display lighting" are not TAWS relevant. It is proposed to modify this sentence by "display intelligibility" as for the aurals..

response | *Accepted*

The text has been amended as proposed.

comment	*52*		comment by: *THALES AVIONICS*

TAWS	**Pages:** P53	**Reference :** GPWS testing (a) (1)

Current NPA text :
(1) Excessive Rate of Descent. Descents toward near level terrain are recommended if they provide the best results and ease of correlation with DO161A envelopes. This test verifies the operation of barometric altitude (and the corresponding computation of barometric altitude rate) and radio altitude.
Thales concern & Rationale for action :
As said before the envelopes of DO161A are no more fully applicable.
Action & rewording proposal:
It is proposed to change "DO161A envelopes" by "designed Mode 1 envelopes".

response	*Noted*

The text has been amended as proposed.

comment	*53*		comment by: *THALES AVIONICS*

TAWS	**Pages:** P53	**Reference :** GPWS testing (6)

Current NPA text :
(6) Voice Callout 'Five Hundred ft. This test can be conducted during an approach to a suitable runway. This test will verify the proper operation of barometric altitude, radio altitude, and height above terrain as determined by either radio altitude.
Thales concern & Rationale for action :
End of this sentence refers to "either radio altitude". What does it means ? Is something missing in this requirement ?
Action & rewording proposal:
Will depend of the answers

response	*Partially accepted*

The text has been amended to clarify the intent of this comment.

comment	*54*		comment by: *THALES AVIONICS*

TAWS	**Pages:** P53	**Reference :** FLTA testing (a)

Current NPA text :
(a) Flight testing to verify the proper operation of the FLTA function can be conducted in an area where the terrain or obstacle elevation for the test runs is known within approximately 300 ft. Two test runs can be performed:
(1) In level flight at approximately 500 ft above the terrain/obstacle of interest.
(2) While descending toward the terrain/obstacle of interest.
Thales concern & Rationale for action :
Obstacles are mentioned here. It should be recognized that obstacle alerting is not part of basic definition of TAWS.
Action & rewording proposal:
It is suggested to suppress the wording "obstacle" or to clarify that it is an optional feature

response | *Accepted*

The text has been amended to delete the reference to 'obstacle'.

comment | *55*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P53	**Reference :** FLTA testing (b) note

Current NPA text :
NOTE: To conduct the test as described, the chosen terrain could be for example at least 15 NM from the nearest airport
Thales concern & rewording proposal:
Precision added to "at least 15NM"with ""at least 15NM away".

response | *Accepted*

The text has been amended.

B. Draft Decision - CS–ACNS - Book 2 - SUBPART E — OTHERS - SECTION 1 - APPENDIX 2: EXAMPLE OF AN ACCEPTABLE TAWS INSTALLATION   p. 58

comment | *25*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P55	**Reference :** Appendix 2 -example of acceptable TAWS installation (d)

Current NPA text :
(d) An ILS/GBAS/SBAS/MLS/MMR receiver for Class A TAWS only..

Thales concern & Rationale for action :
This example provide a list of approach capabilities, among which GBAS and SBAS.
For the time being, GPWS Mode 5 is based on ILS glideslope signals. As written, it seems that this NPA open the door for performing GPWS Mode 5 alerting based on GBAS and SBAS signals. Is it the intent ?

Action & rewording proposal:
If yes, this should be clearly stated in a specific requirement. On the contrary, GBAS and SBAS should be suppressed from this list as a mean to provide glideslope deviations for GPWS Mode 5 alerting. Same concern with MLS to a lower level since it is like ILS an independ ground system providing ILS-look alike signals.

response | *Not accepted*

Appendix 2 is an example of a possible installation and it should be noted that in AMC1-CAT.IDE.A.150 Terrain Awareness Warning System (TAWS): The requirement for a Class A TAWS to provide a warning to the flight crew for excessive downwards glide slope deviation should apply to all final approach glide slopes with angular vertical navigation (VNAV) guidance, whether provided by the instrument landing system (ILS), microwave landing system (MLS), satellite based augmentation system approach procedure with vertical guidance (SBAS APV (localiser performance with vertical guidance approach LPV)), ground-based augmentation system (GBAS (GPS landing system, GLS) or any other systems providing similar guidance. The same requirement should not apply to systems providing vertical guidance based on barometric VNAV.
This requirement also includes RNP ACPH to LPV minima operation based on SBAS. AMC 20-28 states that there is a capability to provide an appropriate output to an installed Terrain Awareness and Warning System (TAWS) enabling the use of the excessive downward deviation from a glideslope function.

comment | *56*   comment by: *THALES AVIONICS*

TAWS	**Pages:** P55	**Reference :** Appendix 2 -example of acceptable TAWS installation (o)

Current NPA text :
(o) A means to initiate the TAWS self-test function on the ground and where feasible in the air.
Thales concern & Rationale for action :
This requirement refers to activating a self-test function in the air, but does not explain the acceptable conditions of feasibility nor its operational rationale.
Action & rewording proposal:
Suggestion is to suppress the end of this sentence.

response	*Accepted*
	The text has been amended.

4 Appendix A – Attachments

[1292 Response.pdf](#)
Attachment #1 to comment [#120](#)

[NPA 2013-06.pdf](#)
Attachment #2 to comment [#143](#)