Comment Response Document (CRD)
to Notice of Proposed Amendment (NPA) 11-2005

for amending the Executive Director Decision No. 2003/12/RM

on General acceptable means of compliance for airworthiness of products, parts and appliances (« AMC-20 »)

Airworthiness and Operational Approval for On-Board Equipment related to ATM Programmes

Explanatory Note

I. General

1. The purpose of the Notice of Proposed Amendment (NPA), dated 2 December 2005 was to propose an amendment to Decision N° 2003/12/RM of the Executive Director of the Agency of 5 November 2003 on general acceptable means of compliance for airworthiness of products, parts and appliances (« AMC-20 ») to propose incorporation of acceptable means of compliance for airworthiness and operational approval for on-board equipment related to Air Traffic Management (ATM) Programmes (e.g. European Air Traffic Management Programme EATMP).

II. Consultation

2. The draft Executive Director Decision amending Decision N° 2003/12/RM was published on the web site (www.easa.europa.eu) on 2 December 2005.

   By the closing date of 16 January 2006, the Agency had received 39 comments from 6 national authorities, professional organisations and private companies. One additional comment was accepted later on after the closing date.

III. Publication of the CRD

3. All comments received have been acknowledged and incorporated into a Comment Response Document (CRD). This CRD contains a list of all persons and/or organisations that have provided comments and the answers of the Agency.

4. In responding to comments, a standard terminology has been applied to attest EASA's acceptance of the comment. This terminology is as follows:

   - **Accepted** – The comment is agreed by the Agency and any proposed amendment is wholly transferred to the revised text.
   - **Partially Accepted** – Either the comment is only agreed in part by the Agency, or the comment is agreed by the Agency but any proposed amendment is partially transferred to the revised text.
   - **Noted –** The comment is acknowledged by the Agency but no change to the existing text is considered necessary.
   - **Not Accepted** - The comment is not shared by the Agency.

5. The Agency's Decision will be issued at least two months after the publication of this CRD to allow for any possible reactions of stakeholders regarding possible misunderstandings of the comments received and answers provided.

6. Such reactions should be received by EASA not later than **16 October 2006** and should be sent by the following link: CRD@easa.europa.eu;

	Para	Commentor	Comment/Justification	Response	Resulting text
1	Draft Decision: AMC 20-9 (Departure Clearance over ACARS) and AMC 20-10 (Digital ATIS over ACARS)	Airbus	Title of these two EASA AMCs which have the same scope and objectives in term of regulatory material, although the operational service is not the same, should have the same "kind" of title. "Temporary" should be removed from the DCL AMC title. AIRBUS proposal: "Acceptable Means of compliance on Approval of … over ACARS"	Accepted	AMC 20-9 Acceptable Means of Compliance for the Approval of Departure Clearance via Data Communications over ACARS AMC 20-10 Acceptable Means of Compliance for the Approval of Digital ATS via Data Link over ACARS
2	Draft Decision: AMC 20-9 all chapters AMC20.9 § 7.4	DGAC France	- Replace each occurrence of ED85 by ED85A**.** and add at the end of paragraph 7.4 the following sub paragraph or note : "Note: It is not intended that aircraft which have received airworthiness approval in compliance with ED 85 requirement should be reinvestigated if installation is compliant with Section 6, 7 and 8 of this AMC." Justification: - ED85A is the up to date document for Departure Clearance via ACARS As stated by EUROCAE, ED 85A supersedes ED 85 but the revised document does not add any new requirements as compared with the original, and is published with the sole intention of clarifying any ambiguities in the fields of message formatting, FSM handling and use of message fields. There is already Departure Clearance application approved onboard aircraft in accordance with ED 85 and their AFM clearly identifies this standard and not the ED 85A. In such a case, compliance findings are not to be done again.	Accepted	ED85 replaced by ED85A The following Note is added at end of paragraph 7.4 Note: It is not intended that aircraft which have received airworthiness approval in compliance with ED 85 requirement should be reinvestigated where the installation is compliant with Section 6, 7 and 8 of this AMC.

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3	Draft Decision: AMC 20-9 Paragraph 1.3 And whole document AMC 20-10 Paragraph 1.3 And whole document	Airbus	In AMC 20-9, ED-85 is recognised as the applicable standard document for the development of DCL service over ACARS, as done in JAA TGL 15. In AMC 20-10, it is the revision A of ED-89, which is recognised as the applicable standard document for the development of D-ATIS over ACARS. But JAA TGL 16 referenced ED-89. These two guidance materials have to remain homogeneous on this point. A statement has to be added in these two regulatory materials to clarify the EASA position in regards with the different revisions of EUROCAE standards ED-85 & ED-89. AIRBUS outline that aircraft are already certified against JAA TGL 15 and JAA TGL 16. If ED-89 A remains the reference standard in AMC 20-10, a statement such as: **"It is not intended that aircraft which have received airworthiness approval in compliance with interoperability, safety and performances requirements provided through ED-89 should be reinvestigated"** should be added in AMC 20-10 (particularly in §6.1.1 Airworthiness Considerations/ General). Justification: Consistency	Partially Accepted See comment 2. ED-85 replaced by ED-85A.	The following note is added at the end of AMC 20-10 paragraph 7.5: Note: It is not intended that aircraft which have received airworthiness approval in compliance with ED 89 requirement should be reinvestigated where the installation is compliant with Section 6, 7 and 8 of this AMC.

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4	Draft Decision: AMC 20-9 Paragraph 3.2	Airbus	To be homogeneous with AMC 20-10 when describing EUROCONTROL LINK 2000+ program, **add "via VHF Digital Link (VDL) Mode 2" in the following sentence:** *"This AMC is not applicable to the phased implementation of data link services within the EUROCONTROL LINK2000+ programme, in particular, D-ATIS over the Aeronautical Telecommunications Network **via VHF Digital Link (VDL) Mode 2**."* Note also that AIRBUS request that the scope of AMC 20-11 is clarified: see AIRBUS comment on the subject.	Partially Accepted Sentence taken from AMC20-10 revised to suit AMC20-9. D-ATIS is therefore replaced by DCL.	First sentence to read: 3.2 This AMC is not applicable to the phased implementation of data link services within the EUROCONTROL LINK2000+ programme, in particular, DCL over the Aeronautical Telecommunications Network via VHF Digital Data Link (VDL) Mode 2.
5	Draft Decision: AMC 20-9 Paragraph 6 , Paragraph 6.3 AMC 20.10 Paragraph 6, Paragraph 6.3	DGAC France	**EITHER add** at the end of paragraph 6.3 of **AMC20-9** after subparagraph (c) the following note, **OR remove** it from end of paragraph 6.3 of **AMC20-10** after subparagraph (e): "Note: The recording of data-link messages for the purposes of accident investigation is under consideration by the regulatory authorities. Until consultation is completed and a decision is reached to publish new regulations, the recording of messages for the interim deployment of Departure Clearance (DCL) using the ACARS remains optional." Justification: Although ICAO Annex 6, Part I, 6.3.1.5.1 requires data-link recording, it seems that they may be difficulties in implementing this standard, concerning	Partially accepted The issue of recording is evolving and it is difficult to formulate text that reflects the actual state as this in itself is a moving target. It is agreed that a kind of "holding text" is used in both AMC's which directs the reader to the recording provisions once they are agreed and in the meantime, no new burden of any kind should be placed on them.	A note is added in AMC 20-9 6.3 and the note in AMC 20-10 6.3 is changed to: Data link recording may be required in accordance with OPS rules

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			in particular the type of aircraft affected (new aircraft versus retrofit) and the concerned data-link application (AOC, ATC,…). We understand that this is for this reason that a note has been added in AMC 20-10 for the transmission of D-ATIS over ACARS. For a consistent approach such note should also be introduced in AMC20-9 for the transmission of DCL over ACARS unless EASA can explain the different approach or unless the problem has been solved and the note can be deleted in AMC 20-10 If the note is maintained, and thus compliance with ICAO can not be attained for all aircraft, the note should raise the attention on such non compliance and EASA should draft a non compliance statement that Member States could file to ICAO.		
6	Draft Decision: AMC 20-9 Paragraph 6.2a and AMC 20-10 Paragraph 6.2a are not harmonized.	Airbus	Note that ED 92A is only applicable at VDL Mode 2 equipment/radio transceiver level (and not at A/C VDL Mode 2 function level). AIRBUS proposal is to replace: initial text from AMC 20-9: A means of data communication appropriate to the area of operation, e.g. single ACARS (specifically the basic standard known by industry as *plain old ACARS*) and VHF or SATCOM. initial text from AMC 20-10: A means of data communication appropriate to the area of operation, e.g. single ACARS (specifically the basic standard known by industry as *plain old ACARS*) and	Accepted	New text for paragraph 6.2(a) in AMC 20-9 and -10 A means of data communication appropriate to the area of operation, e.g. plain old ACARS over AVLC (Aviation VHF Link Control) through VHF or SATCOM. Note: VDL Mode 2 equipment can be used provided that radio transceiver is compliant with ED-92A.

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			VHF or SATCOM. VDL Mode 2 equipment can be used provided that radio transceiver is compliant with ED-92A. by the following: **<u>AIRBUS proposal:</u> A means of data communication appropriate to the area of operation, e.g. plain old ACARS over AVLC (Aviation VHF Link Control) through VHF or SATCOM.** **Note: VDL Mode 2 equipment can be used provided that radio transceiver is compliant with ED-92A.**		
7	Draft Decision: AMC 20-9 paragraph 8.1.1, 8.1.2 and title of 8.1	DGAC France	a) Change the title of 8.1 to: " 8.1: Aircraft ~~Identification~~ <u>information</u>:" b) In 8.1.1, add reference to ICAO document for the format to be used. c) Modify 8.1.2 as follows: "8.1.2 Aircraft ~~identification~~ <u>type notification /type designator</u> includes both *Aircraft Type* and *Sub-type* <u>and shall be coded in accordance with the format described in ICAO document 8643 at its latest edition</u>. However, certain ACARS equipment can be pre-programmed only with *Aircraft Type* with the possibility of manual insertion of *Sub-type* via the system control panel. Absence of the *Sub-type* ~~parameter~~ <u>information</u> ~~either~~ may lead <u>either</u> to a rejected departure clearance request at some airports, or the issue of an inappropriate clearance where the	Partially accepted a) The cross reference to the "flight identity" in the applicable flight plan suggests that this is aircraft identification and not just "information". b) Not accepted. It is only intended to distinguish between ICAO and IATA airline coding. The proposal in c) is correct but we think the correct word is "aircraft type designator" and this should be used.	Title 8.1 Flight Plan Information AMC 20-9 8.1.2 to read: Aircraft type designator includes both *Aircraft Type* and *Sub-type* and shall be coded in accordance with the format described in ICAO document 8643 at its latest edition. However, certain ACARS equipment can be pre-programmed only with Aircraft Type with the possibility of manual insertion of *Sub-type* via the system control panel. Absence of the *Sub-type* information may lead either to a rejected departure clearance request at some airports, or the issue of an inappropriate clearance where the aircraft performance capability is not taken into account. Where, to obtain the DCL service, *Sub-type* needs to be entered manually, the entry should be verified Add reference to ICAO DOC 8643 to paragraph 4.2

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			aircraft performance capability is not taken into account. Where, to obtain the DCL service, *Sub-type* needs to enter manually, the entry should be verified." and add ICAO Doc. 8643 in the list of referenced documents within paragraph 4.2. Justification: a) As explained below, 8.1 does not only deal with "aircraft identification" and thus a more generic title should be used. It is proposed to use "Aircraft information" b) For completeness, reference should be added to ICAO document defining the format of the "aircraft identification" c) The word "aircraft identification" relates to the unique aircraft accomplishing a particular flight. It can be the airline flight identification (ex. AF8001) or aircraft registration (ex F-GLMZ). The wording "aircraft identification" to describe the type/subtype of a family of aircraft is inappropriate. ED85A uses "aircraft type notification" while "Aircraft type designator" is used by ICAO doc 8643. DGAC propose to use both terms in order to keep traceability. DGAC recommends adding in the paragraph a clear reference to the applicable documentation, i.e.		

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			ICAO document 8643 naming rules (value is coded on four characters maximum). Transmission of an erroneous aircraft type value can lead to the selection by ground systems of an inadequate model of aircraft performances opening the way to the anticipation of a wrong flight profile and hence a potential degraded air traffic control service. It can also disturb route charges computation for each flight leading to a degraded service to users.		
8	Draft Decision: AMC 20-10 Paragraph 7.4	DGAC France	7.4: The Aircraft Flight Manual (AFM) or the Pilot's Operating Handbook (POH), whichever is applicable, should identify the *D-ATIS over ACARS* application as having been demonstrated with data link services declared compliant with EUROCAE document ED-89A. <u>If certification was not achieved at the level " essential", the AFM shall remind the crew that they are responsible for checking the D-ATIS information received over ACARS is consistent with their request, or revert to a voice ATIS.</u> Justification: To mention that the FM shall document the D-ATIS as demonstrated compliant with ED-89A is of not sufficient for the crew, who is not familiar with certification specifications. If there is a need for the crew to confirm the information received, the AFM shall describe the procedure in order to be able to comply with 8.1 (8.1.4 states that performance and integrity is acceptable without a voice ATIS cross check if	Accepted	Add text at end of paragraph 7.4 If certification was not achieved at the level " essential", the AFM shall remind the crew that they are responsible for checking the D-ATIS information received over ACARS is consistent with their request, or revert to a voice ATIS.

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			system is certified essential and 8.1.5 that for non essential system", the crew should revert to voice ATIS).		
9	Draft Decision: AMC 20-10 Paragraph 7.5	DGAC France	To add at the end of paragraph 7.5 the following subparagraph or note: "Note: It is not intended that aircraft which have received airworthiness approval in compliance with ED 89 requirement should be reinvestigated if installation is compliant with Section 6, 7 and 8 of this AMC." Justification: There is already Digital ATIS application approved onboard aircraft in accordance with ED 89 and their AFM clearly identifies this standard and not the ED 89A. As stated by EUROCAE, ED 89A supersedes ED 89 but the revised document does not add any new requirements as compared with the original, and is published with the sole intention of clarifying any ambiguities in the fields of message formatting, FSM handling and use of message fields. Therefore already existing approved installation with ED-89 shall not be reassessed again against ED-89A.	Accepted	Add at the end of paragraph 7.5 the following note: "Note: It is not intended that aircraft which have received airworthiness approval in compliance with ED 89 requirement should be reinvestigated where the installation is compliant with Section 6, 7 and 8 of this AMC."
10	Draft Decision: AMC 20-10 Paragraph 8.2.2	DGAC France	a) Change the title of 8.2 and the text of 8.2.1 as follows **"8.2 Operations ~~Manual~~ Procedures and Training** ~~8.2.1~~ The ~~Operations Manual~~ Operator's procedures should ~~be amended to~~ reflect the Flight Manual statement of paragraph 7.4, and the *Operational Considerations* discussed in paragraph 8 of this	Partially accepted Text to be harmonized with AMC 20-9 8.3 dealing with similar issues including renumbering. If no Operators Manual is existent no action is required. In the same manner AMC 20-9 8.3.1 has been changed.	Text changed to: 8.2.1 The Operations Manual shall reflect the Flight Manual statement of paragraph 7.4, and to define operating procedures for the use of D-ATIS via ACARS taking into account the *Operational Considerations* discussed in paragraph 8 of this AMC. 8.2.2 Similarly, flight crew training shall address:

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			AMC. Similarly, flight crew training should be reviewed to address: The different data link services available using the same airborne equipment (e.g. differences between ATIS provided through D-ATIS service that are declared to conform to ED-89A requirements, and ATIS received through other means such as ACARS AOC). The procedures for safe use of D-ATIS over ACARS. b) Delete 8.2.2 Justification: a) The paragraph as written does not take into account operators without a Operational Manual. b) It is not in the AMC to state if the acceptance of a change to the Operational manual or training programme is necessary or not, this can only be required at the level of the regulation.		(a) The different data link services available using the same airborne equipment (e.g. differences between ATIS provided through D-ATIS service that are declared to conform to ED-89A requirements, and ATIS received through other means such as ACARS AOC). (b) The procedures for safe use of D-ATIS over ACARS. 8.2.3 Subject to any arrangements that may be required by the responsible operations authority in respect of amendments to the Operations Manual, and the approval of training programmes, the aircraft operator may implement operations using D-ATIS over ACARS without the need for further formal operational approval. AMC 20-9 8.3.1: The Operations Manual shall reflect the Flight Manual statement of paragraph 7.3 and define operating procedures for use of the DCL.
11	Draft Decision: AMC 20-11	Airbus	The scope of this advisory material as developed through Preamble (Section 1) and Purpose (Section 2) has to be clarified. It is not obvious to determine if this guidance material is edited to support EUROCONTROL Link 2000+ Pioneer phase implementation or Link 2000+ Mandate phase implementation. Development and implementation hypothesis, as well as the reference standards associated to these two implementations are not the same as	Partially Accepted AMC 20-11 scope is LINK 2000+ program mandate phase: The whole content of the document is reviewed accordingly This means that there is no dedicated guidance material for the approval of LINK 2000+ program pioneer phase applications. EUROCONTROL provided LINK Baseline, Version 1.3, March 2006 as baseline for the program.	reference to the following EUROCONTROL document in paragraph 4.2 of AMC 20-11 changed: Replace ECIP: ATC06 Implement the first set of non-time critical ATC air ground data link services based on the voluntary carriage of data link by aircraft. by LINK Baseline, Version 1.3, March 2006

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			developed in „justification“ part of this comment form. If "early approval" quoted in Section 2 "PURPOSE" means "LINK 2000+ Pioneer Phase" Aircraft implementation, the whole document content has to be reviewed, in particular the following items: - list of operational services identified in Section 3.1 has to be updated accordingly, - list of related Standards and Guidance Material identified in Section 4.2 has to be updated - EUROCONTROL baseline document has to be identified instead of ECIP:ATC06 and AGC-ORD-01 documents (see hereafter). - Voice Read-Back procedure has to be introduced in Section 6.1 Airworthiness considerations/General - Aircraft Flight Manual statement proposed in Section 7.3 has to be reviewed. This also means that no regulatory material is yet available for LINK 2000+ mandate phase. Justification: **<u>For the pioneer phase</u>**, the baseline for the development of airborne and ground systems is summarizing in a dedicated EUROCONTROL document called **"LINK Baseline - Pioneers Phase"** (reference: LINK2000+/PM/Baseline/PIONEER_P		Delete last paragraph in § 1: Airlines…necessary Delete …early… in paragraph 2

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			HASE, Version No:1.1, current version dated:11th November 2005), under final development. This document summarizes all the specific hypothesis for the development and the implementation of air/ground systems capable of pioneer phase operations, e.g. mandatory ATS services/set of messages, applicable documents and standards, procedures .... In particular, it introduces and identifies as applicable: - **ED-110 rev. A/DO-280 rev. A** "Interoperability Requirements Standard for ATN Baseline 1 (INTEROP ATN B1)", which defines and allocates minimum air-ground interoperability requirements to the ATS stakeholders - **ED-120** "Safety and Performance Requirements Standard for Initial Data Link Services In Continental Airspace (SPR IC)", which provides and allocates minimum end-to-end safety and performance requirements to the ATS stakeholders - The use of **Voice Read-back** for the exchange of all **"profile changing" messages.** **For the mandat phase**, the baseline for the development of airborne and ground systems is summarizing in a dedicated EUROCONTROL document called "**LINK Baseline 1"** (reference: LINK2000+/PM/BASELINE/1, Version No:1.2, current version dated:11th		

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			November 2005), still under development. For the mandate phase, the following standard documents will be applicable: - **A new revision of ED-110** is going-on to introduce the "protected mode" **ED-120** "Safety and Performance Requirements Standard for Initial Data Link Services In Continental Airspace (SPR IC)"		
12	Draft Decision: AMC 20-11 Paragraph 3	Airbus	A paragraph similar to paragraph 3.2 has to be developed to address/cover airborne step-by-step implementation, in the same way as it is done for the ground. AIRBUS proposal: Add a paragraph 3.3 "Aircraft can implement initial data-link services on a step by step basis to meet local operational implementations" Justification: Airborne implementation should also have the possibility to be developed on a step-by-step basis provided that interoperability is ensured with the ground for the chosen implemented services. It should also be the same for ground implementation.	Not accepted Paragraph 3.2 is deleted as it is outside the scope of EASA. The document aims for the final implementation and does not provide partial steps in respect to aircraft certification. LINK specifies what must be implemented air and ground in the European context in its Baseline documents. We cannot have different steps decided by individual ANSPs or Airlines/Manufacturers.	Deletion of paragraph 3.2.
13	Draft Decision: AMC 20-11 Paragraph 3.2 Note in paragraph 3.2 and associated Footnote 1.	Airbus	Meaning of "early" implementation is not clear. References to EUROCAE standards have to be reviewed in consistency with AMC 20-9 and AMC 20-10. AMC 20-9 reference ED-85 as applicable, not ED-85A. See AI	Partially accepted Paragraph 3.2 was deleted in accordance with the response to comment 22.	Delete "early" in the note and delete footnote

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			comments on AMC 20-9 and AMC 20-10. There is no JAA and/or EASA documents developed to support ARINC 623 OCL application and based on ED-106A. Justification: There is no EUROCAE document presently developed to address consistency issues between ED-120, ED-85A, ED-89A and ED-106A on interoperability, safety and performance aspects. Intend of this footnote has to be clarified.		
14	Draft Decision: AMC 20-11 Paragraph 4.2	Airbus	Remove reference to ATC06 and AGC-ORD-01 in EUROCONTROL documents list and refer to EUROCONTROL Baseline documents (see comment 1). Remove DO-250 in FAA documents list. Justification: FAA CPDLC Build 1 program is withdrawn.	Accepted For EUROCONTROL doc see comment 11	DO-250 removed in the RTCA documents list.
15	Draft Decision: AMC 20-11 Paragraph 4.2 Related Standards and Guidance Material. EUROCONTROL.	Eurocontrol	Please add the reference "*LINK Baseline 1, Version 1.1, April 2005*". Justification: LINK Baseline reference is relevant reference.	Partially Accepted For EUROCONTROL doc see comment 11 Reference is made to Baseline I, Version 1.3	

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16	Draft Decision: AMC 20-11 Paragraph 6.1.3.	Airbus	Text has to be modified as proposed: **"The VDL mode 2 radio transceiver should be compliant with ED-92A."** Justification: VDL Mode 2 MOPS are not applicable at aircraft system/function level, but only at transceiver level. Proposed modification is in accordance with Paragraph 6.1a of AMC 20-9 and AMC 20-10	Accepted	Change text in 6.1.3 to: The VDL mode 2 radio transceiver should be compliant with ED-92A."
17	Draft Decision: AMC 20-11 Paragraph 6.2.2.4 AMC 20-11 paragraph 3.2	DGAC France	In paragraph 6.2.2.4, replace the word "suppressed" by "delayed" . In paragraph 3.2 add the following text: Note: Implementation of a subset of these services on the aircraft is also allowed in accordance with implementation programmes. Justification: The wording "delayed" seems more accurate to describe the fact that the annunciation do not happen during critical phases and are delayed until it is acceptable to "disturb" the crew. Comment number 26 on JAA NPA 20-11 was "accepted" but seems to be forgotten in this EASA AMC.	Partially accepted See comment no 12, where paragraph 3.2. was deleted	Use of the word "inhibited" in 6.2.2.4
18	Draft Decision: AMC 20-11 Paragraph 6.2.3.1.	Airbus	Remove ADS from the bracket in the end of the sentence: (CPDLC, D-FIS or ADS) Justification: ADS application is not part of the technical scope of this AMC (see paragraph 3)	Accepted The list in brackets is deleted as it does not provide additional clarification.	Delete text in brackets at end of paragraph 6.2.3.1

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19	Draft Decision: AMC 20-11 Paragraph 8	Airbus	Operational Consideration Section is still reserved pending the issue of ops TGL 40. The scope of the current draft of the TGL is also not clear: pioneer phase versus mandate phase. AIRBUS is commenting this draft in the same way.	Noted It is planned to implement the section as provided by JAA if available before final publication.	The paragraph stays with the text Reserved Paragraph 2 last sentence: Delete: is being developed in parallel.
20	Draft Decision: AMC 20-13 All paragraphs.	Airbus	A list of abbreviation has to be added in the AMC. Justification: Acronym such as AHS in paragraph 9.7 is not obvious and usual.	Accepted	A paragraph 16 List of Abbreviations is added In paragraph 9.7 AHS changed to AHRS.
21	Draft Decision: AMC 20-13 Paragraph 4 "Reference Material"	Airbus	Add ARINC 718 A: "Mark 4 Air Traffic Control Transponder" Justification: ARINC 718 A is the reference standard for the development of Mode S transponder. It details technical requirements to be demonstrated. In particular, it details/standardizes data to be provided for EHS function and sources.	Accepted	Add chapter 4.7 ARINC and reference to doc (a) Mark 4 Air Traffic Control Transponder *(ATCRBS/MODE S), ARINC 718A-1, March 2004* Add ARINC address to chapter 15
22	Draft Decision: AMC 20-13 Paragraph 5.3 has to be removed from this AMC, whose scope is definitively EnHanced Surveillance.	Airbus	Paragraph 5.3 addresses the way to demonstrate compliance to the standards addressing extended squitter function, when implemented in the transponder. But the scope of the proposed AMC is only the EnHanced Surveillance. Moreover, the requested extended squitter status "enabled/disabled" in the Aircraft flight Manual may add confusion, in particular for the airline, because the proposed statement does not permit finally to conclude whether the function is certified or not.	Accepted The related paragraph 10.3 dealing with extended squitter is deleted as well.	Delete paragraph 5.3 and renumber 5.4 to become 5.3 instead Delete paragraph 10.3 and 10.4 renumbered

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			AIRBUS proposal is to remove paragraph 5.3 from AMC 20-13. Justification: Dealing with Extended Squitter as proposed in paragraph 5.3 adds confusion on the perimeter of this AMC. Moreover, operational needs for Extended Squitter function are still not yet frozen and related applicable standards too. Dedicated materials will developed to cover Extended Squitter function certification, when mature.		
23	Draft Decision: AMC 20-13 Paragraph 6	Airbus	Paragraph 6 references JAA TGL N°13, whereas AMC 20-18 is quoted in paragraph 4.1 as a reference material. JAA TGL N°13 is not quoted in paragraph 4.1. We assume that AMC 20-18 will be the transposition of JAA TGL N° 13 into AMC-20, and that it will be subject to the NPA resulting from rulemaking task 20.006, Miscellaneous Improvements to AMC 20, planned 1q 2006. We suggest that the Agency organize a common review of comments received on both AMC 20-13 (enhanced surveillance) and AMC 20-18 (elementary surveillance), with a review group, in order to adopt coordinated AMCs at the same time. Justification: Need to ensure consistency between both AMC's	Partially Accepted AMC 20-13 is the successor of TGL 18. TGL 13 will be converted into AMC material in a separate step due to time constrains. As a consequence the material is directly incorporated into this AMC. .	New paragraph 6: 6.1 The transponder Level is defined by ICAO and identifies the communication protocol capabilities of the transponder. Level 1 This is the basic transponder permitting surveillance based on Modes A and C as well as Mode S. With a Mode S aircraft address, it has the minimum features for compatible operation with the Mode S system. It has no data communication capability, is not prescribed for international flights, and does not satisfy the European requirement. Level 2 has the capabilities as Level 1 but permits standard length digital communication from ground to air and air to ground using Comm A and Comm B protocols. It includes automatic aircraft identification reporting. Level 3 has the capabilities as level 2 but permits extended data communications from the ground to the aircraft using the Comm C protocol. The usefulness of this standard of transponder has been largely overtaken by technological advances. Level 4 has the capabilities as level 3 but

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					permits extended data communications from the aircraft to the ground using the Comm D protocol. Level 5 extends these protocols to permit Comm B and extended length and simultaneous data communications with multiple interrogators. This level of transponder has a higher minimum data communication capability than transponders of lower levels. In addition to the above designations, the letters “e” and “s” are added to indicate that the transponder includes extended squitter functionality and surveillance interrogator (SI) code capability. Basic functionality with SI code capability is the minimum level permitted for operations in European airspace hence the transponder required is designated ICAO Level 2s. (Amd 77 to ICAO Annex 10, Vol IV, paragraph 2.1.5.1.7). 6.2 The transponder Mark is assigned by ARINC/ EUROCAE and defines required equipment characteristics for the interface between the transponder and other aircraft systems. Equipment characteristics have the objective of standardising those aspects of equipment design which affect interchangeability between different brands. Mark 3 corresponds to ARINC Characteristic 718. Mark 4 corresponds to the ARINC Characteristic 718A. This standard of equipment includes extended interface functions which provide for the access of aircraft derived data necessary to fulfil the functions of automatic dependent surveillance -broadcast (ADS-B), extended (112 bit) squitter functions for passive surveillance, the surveillance capabilities

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					specified in the ICAO Manual on Mode S Specific Services, and dedicated communication functions. Notes: 1. The Mark 4 transponder does not support altitude data in Gillham's code format and is not backward compatible with the Mark 3 equipment. 2. Compliance with an ARINC Characteristic is not required for certification. 6.3 A detailed technical definition of the aircraft derived data is given in Amd 77 to ICAO Annex 10, Vol III, Part 1, Appendix 1 to Chapter 5, 'Tables for Section 2'.
24	Draft Decision: AMC 20-13 Paragraph 8.2 b)	Airbus	In BDS 5,0 (Track and Turn Report), we notice that reference is made to the True Airspeed parameter. It is stated that this parameter has to be downloaded in case the track angle rate could not be. Ground operational need has to be clarified on this request (theses kinds of parameters are not "interchangeable" from an operational point of view …) and reference material for this request identified in paragraph 4. Operational needs for BDS 5, 0, as well as for BDS 4,0, do not seem very well frozen and described in reference materials.	Not accepted Some installations need the possibility to transmit the true airspeed parameter instead of the Track and Turn Report	
25	Draft Decision: AMC 20-13 Paragraph 8.3	Airbus	It is not part of an EASA AMC to update requirements extracted from ICAO Annex 10, without any substantiation on operational need and Air/ground coordination. The following sentence has been added in this AMC in paragraph 8.3, since last	Not accepted The text contained in the AMC material is not an update or change to the requirements detailed in ICAO Annex 10 but a reminder to correctly service registers 1,D to 1,F for implementations not supporting MSP services.	

	Para	Commentor	Comment/Justification	Response	Resulting text
			versions of NPA 20-12a & b: **"For implementations not supporting MSP services, the correct servicing of register 1,D to 1,F corresponds to at least transmitting 0 in response to extraction of theses registers. In such case the setting of the bits corresponding to BDS 1,D to 1,F in BDS 1,8 may be accepted either as being 1 or 0."** This kind of requirements does not seem to be harmonized. Rationale for requesting such implementation has to be provided, because it is not the standard for all aircraft implementations. AIRBUS proposal: to remove this paragraph because not harmonized requirements.		
26	Draft Decision: AMC 20-13 Paragraph 9.7	DGAC France	9.7 Dual transponder and Dual sensors side installation: Particular attention should be given to the interface between dual (or more than 2 transponders) and dual or multiple sensors. In this context, 'sensors' refers to FMS, IRS, AHS, ADS, GPS, Data Concentrator or other systems used to provide data to the transponder. ~~for Altitude Reporting, Elementary Surveillance, Enhanced Surveillance, or Extended Squitter (e.g., Automatic Dependent Surveillance-Broadcast (ADS-B) or other Mode S Specific Services (MSSS) functions.~~ Justification: - Add a title to this chapter because it is quiet long and address only dual transponder with dual sensors.	Accepted	The comments 26, 27, 28, 29 result in the following text: 9.7 Dual transponder and Dual sensors side installation Particular attention should be given to the interface between dual (or more than 2 transponders) and dual or multiple sensors. In this context, 'sensors' refers to FMS, IRS, AHRS, ADS, GPS, or Data Concentrator (or other) systems used to provide data to the transponder. Transponder Selection: Appropriate means should be provided for the flight crew to select the active transponder at any given time. At all times, the active transponder should be selected such that it operates as either the captain's side or the co-pilot's side transponder. This is an important

	Para	Commentor	Comment/Justification	Response	Resulting text
			- Extended squitter should not be addressed in this document which is dedicated to EHS only. Similarly for ELS, if there are some avionics architecture considerations for ELS it should be written in the TGL_13. If we do not strike out end of paragraph as proposed, one can have the impression that it is important to pay "particular attention to the interface" for the purpose of "extended squitter/ADS B."		consideration when more than 2 transponders are available to the crew. Sensor Selection: In an installation where crew sensor selection capability for the active transponder is provided, the crew should be aware, at all times, which sensors (captain's or co-pilots side) are providing information to the active transponder. The selected active transponder should use the crew selected sensor relevant to the aircraft flight profile. Note 1: In a 'standard' installation, where crew sensor selection for the active transponder is **not** provided, the captain's side transponder should utilise the captain's side sensors and the co-pilot's side transponder should utilise the co-pilot's side sensors. Note 2: It is important to note that data parameters from different sensors, of the same type, should not be mixed. For example, Mode-C or Mode-S altitude reporting information from ADC source #1 should not mixed with reporting of TAS, Baro Vertical Rate, Mach from ADC source #2. In case of partially blocking data output from either ADC source #1 or #2 will cause uncorrelated results. This could result in problems with ATC ground processing of the data.
27	Draft Decision: AMC 20-13 Paragraph 9.7	Airbus	It is a new paragraph (since NPA 20-12a edition). Scope of this paragraph should be reviewed to only address EnHanced Surveillance. Content of this paragraph has to be clarified and rationales given for editing such a paragraph knowing that ARINC 718 standard already details information sources and aircraft implementation for EHS function.	not accepted ARINC 718 is not a certification specification and more advanced installations have already been proposed.	
28	AMC 20-13 Paragraph 9.7	Airbus	For the captain's side transponder: The captain's side (e.g., on-side) sensor should be connected to the captain's side (e.g., on-side) input of the captain's side transponder. The co-pilot's side (e.g., cross-side) sensor should be connected to the co-pilot's side (e.g., cross-side) input of the captain's side transponder. Additional explanation: this is not possible based on the transponder current definition: in Arinc 718A, only 1 input per source is considered (in particular for mark 3 transponders). This type of requirement is in addition to Arinc requirements, and should not be	Partially Accepted see 27	

	Para	Commentor	Comment/Justification	Response	Resulting text
			part of a regulatory material. Sensor Selection: The crew should be aware, at all times, which sensors (captain's or co-pilots side) are providing information to the active transponder. Where necessary, appropriate means should be provided to command the selected active transponder to use the crew selected sensor that is being used to control or report parameters that are relevant to the aircraft flight profile. Further explanation: this requirement is very stringent, as it imposes some monitoring and indication of the current source used for data transmitted in the mode S registers. Currently, there is no indication on the source transmitting the data, as the architecture permits implicitly to know which source is connected to the transponder. In addition there is no mean to select the IRS source for example (IRS1 is connected to ATC 1 only). Remove this requirement as it is more stringent than Arinc specification.		
29	Draft Decision: AMC 20-13 Paragraph 9.7, item "Sensor Selection", its general text part, the note 1, note 2 and note 3	DGAC France	Sensor Selection: In an installation where crew sensor selection capability for the active transponder is provided, the ~~The~~ crew should be aware, at all times, which sensors (captain's or co-pilots side) are providing information to the active transponder. ~~Where necessary, appropriate means should be provided to command the~~ The selected active transponder should ~~to~~ use the crew	Partially accepted	

	Para	Commentor	Comment/Justification	Response	Resulting text
			selected sensor ~~that is being used to control or report parameters that are~~ relevant to the aircraft flight profile. ~~Note 1: In a 'standard' installation, where crew sensor selection for the active transponder is **not** provided, the captain's side transponder may utilise the captain's side sensors and the co-pilot's side transponder may utilise the co-pilot's side sensors.~~ ~~Note 2: In an installation where crew sensor selection for the active transponder is provided, the crew should be aware of the selected sensor (captain's or co-pilot's sensor) at all times.~~ Note 1~~3~~: It is important to note that data parameters from different sensors, of the same type, should not be mixed. For example, you should not be reporting altitude information from ADC #1 in your Mode-C and Mode-S replies and then report TAS, Mach, Baro Vert. Rate, from ADC #2. Why? Because if a Static port became partially blocked, data output from ADC #1 and #2 will not correlate. This could cause problems with the ATC ground processing of the data. Justification: a) regarding the general text and note 2: If the crew has no means to select the sensor side, it is useless for the pilot to know which sensors are used for the transponder. Note 2 was certainly added in the NPA to mitigate the general text too strong. It is better to remove note 2 and simply state in general text what is		

	Para	Commentor	Comment/Justification	Response	Resulting text
			strictly required. b) Note 1: The wording seems too vague when using "may utilize": Either there is a reason and a need to recommend for installations where crew selection has to be done or the note is to be removed. Second option is proposed. c) Note 3 is renumbered due to previous changes.		
30	Draft Decision: AMC 20-13 Paragraph 9.9	Airbus	Paragraph 9.9 has to be removed and Table 3 too. Justification: Classification (minor or major change) of EHS modifications of operators on aircraft within JAA/EASA countries should be in line with Part 21 and related AMC/Guidance Material.	Partially accepted We agree that the Part 21 process has to be used but offer additional guidance information in this AMC.	Resulting text: Guidance on the classification (minor or major change) are stated in GM 21A.91. Table 3, Annex 1 of this AMC offers additional guidance for the classification of Elementary and Enhanced Surveillance modifications
31	Draft Decision: AMC 20-13 Paragraph 12.4 alinea "iii"	DGAC France	iii. does provide ~~DF 11 Acquisition~~ Squitter transmissions <u>whatever air/ground position</u> ~~in the air~~ (on ground acquisition squitter <u>DF 11</u> is replaced by extended squitter DF-17, when enabled). These tests are required to ensure that the ~~WOW~~ <u>air ground switch</u> is correctly interfaced with the transponder. Justification: This chapter was added to insist on the transponder behavior on the ground in particular that squitters are still transmitted according to ground/air position. The WOW switch is <u>not the only mean</u>s to determine the air ground logic. (ground speed provided by the GPS to the transponder can also be used to determine the air ground switch)	Partially accepted Text reworded to be technology independent	Change the last line in paragraph 12.4 to read These tests are required to ensure that the transponder reacts correctly to the on ground condition.

	Para	Commentor	Comment/Justification	Response	Resulting text
32	Draft Decision: AMC 20-13 Paragraph 12.4 alinea "i"	DGAC France	i. does not respond to an 'All Call' interrogation (Mode A/C/S all-call and Mode S only all-call) when on ground, and Justification: Added wording to clarify what is the "all Call" interrogation.	Accepted	Change text in 12.4 i to read does not respond to an 'All Call' interrogation (Mode A/C/S all-call and Mode S only all-call) when on ground, and
33	Draft Decision: AMC 20-13 Annex 1,Table 1, item 6 & 7.	DGAC France	Table 1: In the column "parameter", add "(Note 9)" for Item 6 and 7. Justification: Obvious reference to note is missing.	Accepted	Add (Note 9) in column parameter for line 6 and 7
34	Draft Decision: AMC 20-13 Annex 1, Table 3	DGAC France	Add a new example "0" which could be "minor" and justified as "Assuming a simple replacement of existing mode S not ELS compliant by an ELS mode S transponder and no antenna change". Justification: In table 3, if we wish to be more exhaustive, it seems that we could add an other example for ELS only aircraft (i.e. less than 5700kg, Cruising TAS <250 kts) when an applicant would like to replace an existing Mode S transponder not ELS compliant by a Mode S / ELS compliant transponder and assuming there is no antenna change. This is independent of an TCAS already installed or not installed.	Partially accepted Instead of adding a new example the Mode A/C information was deleted to make the existing example more generic.	Delete Mode A/C in table 3 example 1
35	Draft Decision: AMC 20-13 Annex1, Table 3 : Examples of Modification Classification	DGAC France	Add an example 1-bis : Installation of an ELS transponder Mode S **and its antenna** should be considered **minor** for small aircraft (< or = 1400kg) Justification: Example N°2 is too stringent and does	Not accepted Table 3 provides guidance, not a listing of possible modifications and their classification. Consensus was reached on the type of modifications provided in the table.	

	Para	Commentor	Comment/Justification	Response	Resulting text
	for Mode S Elementary & Enhanced Surveillance Aircraft Installations : Example N°2		not take into account small aircraft (< or equal 1400kg), for which antenna installation has always been considered as minor.		
36	General	Airbus	As pioneer in LINK2000+ Program we fully support the NPA-11-2005	Noted	
37	General	UK CAA	The UK CAA has no comments on the above mentioned document	Noted	
38	General	FAA	No Comment.	Noted	
39	General	Austrocontrol	Austro Control is fully supporting NPA 11/2005.	Noted	
40	General comment All paragraphs	Airbus	We suggest the setting up of a review group to address the comments received on this NPA, at least on AMC 20-13 (Certification of Mode S Transponder Systems for Enhanced Surveillance). In conjunction, this group should review comments to be received on AMC 20-18 (Elementary Surveillance), which we understand will be part of the NPA resulting from rulemaking task 20.006, to be circulated in first quarter 2006. Justification: Significance of comments received (at least ours). Need to ensure consistency of advisory material on elementary and enhanced surveillance.	Accepted	Review was done by the CNS/ATM STG