

NPA 21-32 - Advisory Material for Changed Product Rule Comments and responses

FOREWORD

The NPA was circulated for comments by letter 1 June 2002 of the Regulations Director. The comment period finished 1 August 2002.

58 comments from 10 commenter; four JAA authorities (SLV-Denmark, Austrocontrol, DGAC-F and CAA-UK), three from European industry (AEA, Rolls-Royce and AIRBUS), two for American industry (AIA and Cessna) and one from an individual commenter (Francis Fagegaltier) were received during this period.

The FAA announced the availability of its draft AC 21.101 change 1 on 23 April 2002 requesting comments until 5 June 2002.

The CPR initiative follows harmonised processes by JAA, FAA and TCCA and so, the revision of comments for both JAA NPA 21-32 and draft AC 21.101 change 1 was made by an ad-hoc group under the responsibility of the CST and with members from the JAA, FAA, TCCA, Brazilian CTA, European, US and Canadian industry.

When drafting the Terms of Reference of the ad-hoc group, the CST took into account the discussions on the Certification Management Team and discussed themselves the need of a change in the rule (JAR-21 Section 1 for the JAA and Final Rule for the FAA); however, due to the long period of time (estimated at least five years) it will need a change in the FAA Final Rule, it was agreed to limit the task for the ad-hoc group to the advisory material only, in the intent to solve the present problems of implementation, leaving for a future initiative the improvement of the rule text.

OTHER ISSUES

As it is stated where appropriate, some commenter required changes in section 1 of JAR-21 either directly or indirectly (some text of the ACJ was found not in line with section 1). When disposing of these comments, the ad-hoc group agreed that a change in section 1 of JAR-21 will facilitate the understanding and probably, the implementation of the CPR. However, as the terms of reference of the ad-hoc group limited its tasks to the ACJ, no proposal is made in this sense, but a request to the CST, to re-consider the amendment of JAR-21 section1.

COMMENTS TO THE NPA 21-32

Three commenter (SLV-Denmark in #1, AEA in #2 and DGAC-F in #27) stated that they had no comments.

One commenter (Cessna in #50) expressed agreement to the NPA.

The rest of the comments (48) propose different changes to the circulated text or requested clarification.

Even if out of the scope of the comments requested special attention must be paid to the request, directly or indirectly, of the change of JAR 21.101 as modified by NPA 21-7(referred to as the rule or the CPR rule).

General comments

There were three general comments to NPA 21-32, Rolls-Royce (#28 and #32) and Airbus (#49),

Rolls-Royce (#28) recognises the NPA 21-32 is an improvement from the previous text but finds it still overcomplicated and confusion by length and repetition. The commenter provides grounds for these statements and concludes that a change in the rule to recover its original intent would better solve the problems than the ACJ.

Rolls-Royce (#32) considers that the ACJ is at odds with the rule in as much as the latter acknowledges that a revision to the applicable requirements can result in a change being significant. The commenter states that there is a general agreement on the ACJ's approach but states that this is an area for a rule change. The commenter also states that providing an exemption in the ACJ is not acceptable.

The ad-hoc group was also of the opinion that only a rule change could really accommodate the commenter concerns, but the ad-hoc group also works under its terms of reference and these limit the drafting to the ACJ only. Consequently no change was introduced in the NPA text.

Airbus (#49) states NPA 21-32 text is very close to draft AC 21.101 Change 1 but the numbering of paragraphs and sub-paragraphs is completely different and requests the numbering to be the same in both documents. Another comment (#22) also asked for the numbering of the ACJ to be revised to comply with JAR-11. The numbering of the NPA has been modified to align with the draft FAA AC; however, the FAA AC having one more section (Content list) all ACJ sections but 1 and 2 have different number and only the sub-sections are in full harmonisation with the FAA AC.

1 (now re-numbered to 2) Applicability

There were four comments in this paragraph, AIA (two comments, #3 and #5), Rolls-Royce (#29) and Airbus (#38).

AIA (#3) requested the paragraph to include the definition of “product level change” to help the reader to focus in the intent of the rule.

Since the explanation of the terminology includes this term, it was not considered adequate to increase the length of the text by this repetition.

AIA also requested (#5) to delete part of the text describing the exceptions as per JAR 21.101(c) and include a reference to the adequate paragraph in the ACJ.

A re-drafting was considered; however, the text is mostly coincident with JAR 21.101 and finally, no change was necessary.

Roll-Royce (#29) requested the second sentence to be re-written for clarification.

In this case, similarly to #3, no change to the text was finally introduced due to the existing text being mostly coincident with JAR 21.101.

Airbus (#38) requested to re-write a paragraph and move it to “purpose”.

The section “applicability” has been moved after “purpose” but the next has not been modified.

After the discussion of the ad-hoc group and also taking account of the comments received by the FAA on its draft AC 21.101, the section “applicability” has not been modified. The reason was to keep this section (applicability) mostly in line with the JAR 21.101 text leaving for the rest of the ACJ to include other concepts and explanations.

The FAA has modified the equivalent section of draft AC 21.101, however, no disharmonisation is expected from this difference in text.

2 (now re-numbered to 1) Purpose

There were two comments on this paragraph, Rolls-Royce (#30) and Airbus (#39).

Rolls-Royce (#30) asked to add “overwhelming” before “majority” to clarify that the significant changes are a very small proportion of major changes.

During the preliminary meeting it was proposed to change this qualifier by “vast”. This change was agreed during the ad-hoc meeting and the ACJ changed accordingly.

Rolls-Royce also requested clarification in the definitions of product level change and significant change in respect of the definitions section of the ACJ.

Since the explanation of terminology section of the ACJ has been modified, the wording in the paragraph “purpose” has been revised to align with it.

Airbus (#39) requested a change in the text to clarify that the exception for not significant changes is established by the requirements and not by the ACJ.

In the preliminary meeting, the existing text was found adequate and no need to change it.

However, for the final text, there were some changes introduced for alignment with the changes introduced in “explanation of terminology”.

There have been two more changes introduced once other sections of the ACJ were revised:

-A sentence to remind that all changes must be approved by the authority, and

-One sentence to state that each change must be judged on its own merit.

These changes are harmonized with the FAA AC text.

4 Explanation of terminology

There were two comments on this paragraph by AIA (#6 & #7).

In (#6) AIA requests to delete the words “or an individual change” based on their opinion that no single change at the system or component level can reach the level of a product level change.

They also request to add (i.e. “derivative product”) (this was also requested in AIA #7) and some generic examples of component level changes.

After discussions in the preliminary meeting, it was found not justified to exclude the possibility of a single change to reach the product level, the text was modified for clarity but keeping the possibility of a single change. The reference to “derivative product” was also not found appropriate because the term is not used in JAR-21 or defined.

The explanation of the terms “significant change” and “substantial change” were slightly modified to respond to comments mainly raised under section 4, Purpose.

The terms have been listed in alphabetical order.

5 General overview of JAR 21.101

There were six comments on paragraph 5 General overview of JAR 21.101, AIA (#8 and #9), Rolls-Royce (#31), Airbus (#40) and CAA-UK (#53, and #58).

There were also two comments, AIA (#10) and CAA-UK (#57) on Figure 1.

AIA (#8) asks for deletion of the whole fourth paragraph but the first sentence justifying the request on that it is a good idea but not said in the rule.

The paragraph was revised and it was agreed that some changes in wording were needed to align with the rule.

It is important also to note that this remarks may have implicit a request for rule change.

AIA (#9) is a duplication of comment 8.

Rolls-Royce (#31) asks for deletion of fifth and sixth paragraphs because they are a repetition of the wording in the rule (JAR 21.101(c) & (d)).

This was partially agreed and the wording revised during the ad-hoc meeting to avoid duplications and restore consistency also taking into account the changes introduced in the explanation of terminology (some text of the mentioned paragraphs is still kept).

Airbus (#40) required to replace “any” by “a” before “change” in the third paragraph to be consistent with the possibility of exceptions.

This comment was agreed in the preliminary meeting and also in the ad-hoc meeting. The change is incorporated in the final draft ACJ.

CAA-UK (#53) requested to add a paragraph to account for the impact of CPR in STC applications in JAR-21 (STC in JAR-21 is in general not harmonised with FAA).

The preliminary meeting it was found that the text was not needed since JAR 21.101 pertains to all changes regardless of whether they are changes to TC or STC’s and their changes. If modified this will introduce a not necessary non-harmonised text, consequently, no change was introduced.

CAA-UK (#58) is purely editorial and was agreed.

AIA (#10) requests to revise the words in box describing step 1 to read “Identify the proposed product level major change” and the wording of section 6 accordingly.

During the preliminary meeting it was found that step1 of figure 1 is about identification of the change and not about its classification, this is done in further steps. As a consequence the proposal was rejected. This was confirmed at the ad-hoc group meeting.

CAA-UK (#57) requests clarification of decision diamond in step 3.

The “Yes” response to the question “Will the latest requirements be used?” is “Yes” at this point if the applicant voluntarily elects to comply with the latest requirements. It was agreed at the preliminary meeting that the text could be modified to clarify the step but after revision at the ad-hoc group meeting it was found that no change was necessary.

6 (now divided into to sections. 6 and 7) Establishing the certification basis

There were fifteen comments in this section, AIA (#4, #11, #12, #13, #14 and #15), F. Fagegaltier (#22), Rolls-Royce (#33 and #36), Airbus (#41, #42 and #43) and CAA-UK (#51, #52 and #54).

AIA (#4) requests to add a paragraph about harmonisation and stating that, for aircraft imported from FAA and TCCA, the JAA shall become cognizant of the certifying authority’s certification basis.

The text was revised during the preliminary meeting and the wording (become cognizant ...) was found not adequate and so rejected. Reference to harmonisation was found not necessary in the ACJ text since the text itself is developed with FAA and TCCA. No change was introduced in the NPA due to this comment.

AIA (#11) requests to delete the sentence “This applies to the discussion and agreement of the methods of compliance together with the resulting scope of the investigation required to demonstrate compliance.” since the MoC are not part of the discussion on applicable requirements.

The comment was partially agreed in the preliminary meeting and the ad-hoc group decided to delete the sentence.

AIA (#12) proposes to replace in the note “some” by “other” to clarify the intent of the process. The preliminary revision rejected this proposal on the basis of no clarification coming from the change in wording. During the ad-hoc group meeting the whole note was deleted based in other comments.

AIA comment #13 also contained an editorial change in the note that was accepted.

AIA (#13) requested to remove from the text (Step 4) the possibility of a single change to reach the significant level.

This request is in line with comment #6 and was rejected due to the same reason. The comment also wanted the deletion of the term “extensive” as not defined. This was preliminary agreed and during the ad-hoc group meeting the whole paragraph had to be reviewed to align the wording with the revised definition of “significant”.

AIA (#14) requested to add “considerable” before “operation envelope expansions” in c) iii. This was partially agreed in the preliminary meeting but no alternative wording was agreed by the ad-hoc group and consequently, no change was introduced.

AIA (#15) is of editorial nature and was agreed in the preliminary meeting.

F. Fagegaltier (#22) requests the ACJ numbering to be consistent with JAR-11.

This comment does not affect the content of the NPA. The numbering was changed (see also disposition of #49) but not to comply with JAR-11, but to align as much as possible with the FAA AC.

This comment also requests to correct the reference in the note to read JAR P-30.

This was agreed in the preliminary meeting (as it only affects the JAA ACJ and not the FAA AC) and incorporated in the text.

Rolls-Royce (#33). This comment requests several changes:

-The first paragraph of the step 1 is found poorly written and with the intent unclear. The proposal was considered by the ad-hoc group meeting and the word “relevant” was replaced by “related” for clarity.

-In step 2, 1st paragraph, the final sentence is not found consistent with the rule or the flow diagram. The sentence was found consistent by the ad-hoc group and so, no change was introduced in the final text.

-In step 3, note, the sentence in parenthesis is found obvious and a repetition. The commenter proposes to delete it. During the preliminary meeting the entire note was proposed for deletion. This was confirmed in the ad-hoc group meeting; consequently, the note has been deleted.

-In step 4, 1st paragraph, a 3rd and 4th sentence, the commenter proposes some changes in the wording for clarity. These changes were in principle agreed during the preliminary meeting; however, during the ad-hoc group meeting the entire paragraph was revised after the changes introduced in the explanation of terminology for “significant”. The final draft has the paragraph slightly modified from the circulated version which the aim of improving clarity.

-In step 4, 3rd paragraph, 2nd sentence, the commenter requests to replace the word “changed” by “met” when talking about criteria.

This was agreed at the preliminary meeting. During the ad-hoc meeting the text was finally changed to “affected”.

-In step 4, paragraph 2, 1st sentence the commenter proposes to add “in combination with the change in question” in the sentence that explains the influence of previous relevant design changes in the classification as significant of a given change.

The proposal was agreed at the preliminary meeting but at the ad-hoc meeting, other changes were introduced in other paragraphs of this section and in a final revision, no modification was made to this paragraph.

-In step 4, using the criteria, the commenter does not understand the phrase “model changes to the Type Certificate” because the term “model” is not widely used or commonly understood in the engine community. The commenter also proposes an alternative text based on the use of Mark No.

The proposal was discussed in the preliminary meeting and the use of the term “model” was agreed not be consistent with JAR-21 (JAR-21 does not use the term) and subject to different interpretations; however, the proposed text used “Mark No.” that is used in the engine field but not for other products. It was agreed that an alternative term more consistent with the terminology would be of benefit. During the ad-hoc meeting, no alternative text was agreed.

The 3rd sentence was also found meaningless.

During the preliminary revision this opinion was agreed, but no alternative was found during the ad-hoc meeting.

Also part of the “note (that only pertains to JAA)” was found meaningless in terms of engine certification.

As a consequence of this comment and general discussion this part of the note was deleted.

-The commenter also finds that the paragraph confirms that a revision to the requirements can not result in a change becoming significant. This is found contrary to the rule.

The sentence was deleted at the ad-hoc group meeting.

-The differentiation between (1) and (2) of “making the classification” is also found not clear. The commenter asks for this particular item to be addressed in JAR-21.

As the ad-hoc group is limited to drafting the ACJ, it is not possible to change section 1 requirements. The text was also checked with the present JAR-21 requirements for DOA and alternative procedures and found suitable.

-The commenter finds that the final paragraph of “making the classification” suggests that for a significant change the compliance with the latest regulations is an option.

At the preliminary revision it was confirmed that compliance with the latest requirements is not an option in case of significant changes when none of the exceptions is met; however, the applicant can always elect to comply with the latest requirements in case one of the exceptions apply.

-In step 5 the commenter finds the final words of the final sentence in the 1st paragraph meaningless.

This comment was agreed in the preliminary revision and following the ad-hoc group meeting, the whole sentence was deleted.

-The wording regarding examples under a) is also found unclear.

As examples are provided in other sections of the ACJ, the examples have been deleted from this paragraph.

-In step 6 the commenter finds that service experience can demonstrate but not provide a level of safety.

The comment was agreed during the preliminary meeting but at the ad-hoc meeting it was decided to keep the wording.

-It is also not understood how a new requirement can compromise an existing level of safety. The commenter proposed to delete the sentence.

This was agreed at the preliminary meeting but after further revision in the ad-hoc group meeting, it was agreed that the wording is consistent with the text in JAR 21.101 and the sentence was kept.

-In the paragraph 1) design, the commenter proposes to provide the rationale in the example if the latest requirements should be used.

An additional text to provide this rational was proposed at the preliminary meeting; however, after discussion at the ad-hoc group meeting, only minor changes were introduced in the paragraph.

- In the 2nd paragraph some wording was found confusing, e.g. “encompass the requirements” and it was not clear what certification basis was mentioned.

This was agreed at the preliminary meeting and in the ad-hoc group meeting it was decided to add “proposed” before “certification basis” for clarification.

Rolls-Royce (#36) , similarly to part of #33 notes that while the ACJ text is true (significant product level changes result in a model change to the Type Certificate) it needs to be made clear that the converse is not true, and they provide reasoning on the case of engines.

At the preliminary revision this comment was agreed. The application for a new model is not necessarily an indication of a significant change in the sense of JAR 21.101 even if associated with hardware changes. JAR-21 does not use the term “model” and as also stated in #33 the concern was acknowledged but no alternative text was agreed in the ad-hoc group meeting.

Airbus (#41) requests the note about assumptions to be deleted because the commenter finds it unclear (this note exists only in the JAA NPA and not in the FAA AC).

The note was revised in the preliminary meeting and it was agreed to delete the second part keeping the clarification on the different meanings of “assumptions” in JAR-21 and JAR-E and JAR-P (see also disposition of #33).

Airbus (#42) proposes an editorial correction to correct the reference to “transport aircraft” and replace it by “large aeroplane”.

This proposal was agreed in the preliminary meeting and incorporated.

Airbus (# 43) proposes an editorial correction to delete the reference: “(see note below)” because this note does not exist.

This proposal was agreed in the preliminary meeting and incorporated.

CAA-UK (#51) expresses the opinion that the text of the ACJ is more definitive than the rule itself and proposes alternative text.

This and other comments pertain also directly or indirectly to the rule text.

The ad-hoc group drafted the ACJ on the basis of the rule and the intent of the original ICPTF and some of the difficulties found in drafting advisory material were identified as the different interpretations that can be derived from the rule text. The text of section 6 was revised in relation to this and other comments trying to make it as clear as possible. While it was always intended to keep the rule language for consistency, the simple copy of rule text was not found appropriate for advisory material.

CAA-UK (#52) requests in the sentence “It should be noted...” to replace the word “hardware” by “physical” to prevent the potential confusion of readers thinking that the paragraph is discussing

the significance of hardware changes versus software changes. This change was agreed at the preliminary meeting but not confirmed at the ad-hoc meeting and the original word finally kept.

CAA-UK (#54) requests to add a new note related with the capacity of the applicant to evaluate the effect of the change in the assumptions and the need of the arrangement between the STC applicant and the TC holder.

This proposal was discussed during the preliminary meeting and rejected because the agreement between STC applicant and TC holder are not altered by the ACJ (see also disposition of #53 under section 5). This item as only pertaining to JAA system was not discussed at the ad-hoc group meeting.

Section 6 has been divided into two, 6 and 7 following a proposal of the FAA. Re-numbering of the subsequent sections has been necessary (in this CRD the references are made to the old numbering for consistency with the circulated version).

7 (re-numbered as 8)Showing compliance with an earlier requirement

One comment was made to this section, Airbus (#44).

The commenter proposes to change “the most recent certification basis for the product being changed” by “an earlier requirement, similarly to unaffected areas” to avoid the text to be misinterpreted as the latest requirements.

The proposal was agreed at the preliminary meeting and confirmed by the ad-hoc group, but at the ad-hoc group meeting the text was changed to “existing certification basis” for clarity.

9 (re-numbered as 10) Special Conditions

One comment Roll-Royce (#34) was made on this section.

The commenter requests to delete the final sentence of the paragraph due to not making sense. This was agreed at the preliminary meeting and confirmed at the ad-hoc group meeting. An additional sentence has been introduced to clarify the consistency of Special Conditions for not significant changes.

New section added by FAA and also incorporated into the ACJ:

11 Documentation

The new section reads:

“All changes that result in a revision to the product’s certification basis must be reflected on the type certificate data sheet. Similarly, the certification basis must be noted on all STC’s”.

This proposal was made by the FAA during the ad-hoc meeting and accepted on the basis that this does not change the intent of the NPA.

Appendix 1

There were four general comments on the appendix, AIA (#16), Rolls-Royce (#35) and CAA-UK (#55 and #56). Part of the comment 33 by Rolls-Royce also concerns this appendix.

AIA (#16) requested the revision of the tables to ensure consistency among products.

While recognising that a change may have different classification in different products the tables have been reviewed by specialists and some similar examples added to other tables to restore consistency.

Rolls-Royce (#35) requests, in the text at the beginning of the appendix, third paragraph to delete the sentence “Future amendments...”

The whole text at the beginning of appendix 1 was reviewed based on this and other comments to make it clearer and to help in the use of the tables. The sentence was deleted as requested but also other text changes were introduced.

CAA-UK (#55) requested to add a sentence to state the need of an STC holder to show to have an arrangement with the TC holder before the guidance provided in this ACJ can be considered applicable. The need of an appropriate agreement between the STC applicant and the TC holder is already covered in Subpart E of JAR-21 and at the preliminary revision it was found that there was no need to repeat in this ACJ the content of other subparts of JAR-21, due the STC requirement not been harmonised with the FAA, this item was not discussed in the ad-hoc meeting.

There were 11 comments on the tables of this appendix, F. Fagegaltier (#21), Austrocontrol (#23, #24, #25 and #26), Rolls-Royce (#37), Airbus (#45, #46, #47 and #48) and CAA-UK (#56).

F. Fagegaltier (#21)

The commenter addresses ten different items. This numbering is followed here:

1- In many places in the “comments” column of the table of not significant examples the words “no controversy” are found. A clarification of the meaning is requested.

After revision of the table, these words were eliminated. Additionally, the column “comments” is changed to “notes” following a proposal by the FAA.

2- The commenter requires clarification of the use of the word “assumptions” in the table. The column “assumptions” of the table relates to the “assumptions “as per the text in JAR 21.101(b)(1)(ii). The column on the table was revised and in the example 9 “no” was changed to “yes” for consistency with definition of significant.

3- This comment relates to the example on change from a bladed disk to a blisk (this example is comment also by #25 and #37)
The example was finally deleted as a separate one and combined with other. Changes have been made to the description of the change and in the notes for further clarity. Also editorial changes have been made to the Note in section 6 of the ACJ. These changes should address the issue raised.

4- The commenter finds some examples questionable, for example the words “performance envelope”. This term has been deleted. Further editorial and descriptive changes have been made to address the comment.

5(first comment numbered 5) - The commenter states other inconsistencies. These have been also addressed in the editorial and descriptive changes.

5(second comment numbered 5) -There are two notes at the end of table 4. The commenter requires explanation or deletion.

The notes were at the end of table 4 because it is also the end of the tables (last table). The notes pertained to all tables and not only to engines. The notes have been deleted as found no longer necessary with the further changes introduced in the tables and other sections of the ACJ.

6-The commenter finds that the examples do not improve understanding of the CPR rule. There have been changes made to the examples on tables of engines and propellers to improve clarity.

7-The commenter expressed that some examples were questionable, as a result the examples have been reviewed and those that were found questionable have been removed.

8-The commenter questions the interest of keeping an example, 10th that he finds questionable. Changes have been made to the 10th example for piston engines to address this comment.

9- The commenter questions the description an example, 12th that he finds not understood. Changes have been made to the 12th example for piston engines to improve understanding.

Austrocontrol (#23) requests to delete from table 1 the example: “Addition of a turbo-charger that changes the power...” due to the item being addressed in table 4 (engines). The tables of examples were reviewed by the specialists during the ad-hoc meeting and some of the examples reworded, deleted or added due to comments on the examples themselves or the changes introduced in other sections for consistency of the whole document. In particular for this example the word “appreciably” has been added in the description and the column “notes” was re-worded to state that the change is not a product level one.

Austrocontrol (#25) requests to delete from table 1 the example “Bladed disk to a blisk” and add to the table of not significant. As reasons for the proposal, they mention the change is a production related change and does not require an update in the certification basis. This example in particular has been commented in #21 and #37. As stated above, the tables of examples were reviewed by the specialists during the ad-hoc meeting and some of the examples reworded, deleted or added due to comments on the examples themselves or the changes introduced in other sections for consistency of the whole document. In particular this example was deleted as a separate one and combined with other.

Austrocontrol (#26) requests to add in table 4 two new examples a) “Addition of a liquid cooling system” and b) “Change from a conventional magneto to a electronic ignition timing”. As reasons for the proposal, they mention:

For a) Change in the assumptions

For b) Change in general configuration and Change in principles of construction.

As stated above, the tables of examples were reviewed by the specialists during the ad-hoc meeting and some of the examples reworded, deleted or added due to comments on the examples themselves or the changes introduced in other sections for consistency of the whole document. In particular an example similar to the first one has been added (“convert from cooled cylinders to liquid cooled cylinders”).

Rolls-Royce at the end of #33 finds that the text in the third paragraph also confirms that rule changes will not trigger a change to be significant. They propose to delete the sentence “Future amendments...examples”.

Due to this and other comments, the whole introductory text has been replaced by new text to clarify the use of the tables.

Rolls-Royce (#37) requires in table 4 to replace the references to Part 33 and 35 by JAR-E and JAR-P and to replace “Turbofan engines” by “Turbine Engines”.

These are editorial changes and were agreed at the preliminary meeting.

They also request to change in example 4 “Bladed disk to a blisk” to re-classify it.

This same example was commented in #21 and #25. The decision to delete the example pertains to all three comments.

They also find in table 4 that example 5 is not significant if the “inherent strength” of the engine is not compromised. They propose to change the description of the change to read “A change in the containment case from hardwall to composite or vice-versa, that is not retrofittable and that changes the inherent strength of the engine” to keep it in the table of significant changes. As stated above, the tables of examples were reviewed by the specialists during the ad-hoc meeting and some of the examples reworded, deleted or added due to comments on the examples themselves or the changes introduced in other sections for consistency of the whole document. In particular this example was re-worded similarly to the proposal.

Airbus (#45) requests in table 2 to replace “transport aircraft” by “large aeroplanes” and “small aircraft” by “small aeroplanes” stating that the change is of editorial nature. This was agreed at the preliminary meeting and the change introduced.

Airbus (#46) proposes to combine the examples 8 and 10 of table 2 stating as reasons for the change that 10% should not be presented as a hard limit for the significance and that this is determined by the extent of redesign and re-substantiation which depends not only on the increase percentage, but also on the previous model’s built-in margins. In the preliminary meeting it was found that by combining the two examples some information is lost. The example was later discussed at the ad-hoc group meeting. The tables of examples were reviewed by the specialists during the ad-hoc meeting and some of the examples reworded, deleted or added due to comments on the examples themselves or the changes introduced in other sections for consistency of the whole document. In particular for these two examples it was agreed that by combining them, some information would be lost and no change was introduced.

Airbus (#47) states that the note in table 2 for not significant changes does not exist in other tables and proposes to delete it for consistency of the document. This was found of editorial nature and agreed.

Airbus (#48) proposes to add a new example in table 2 for not significant. The example is described as “Wing tip modification, addition of winglets to improve aerodynamic efficiency”. The proposed example was reviewed at the preliminary meeting and rejected because example 11 already covers this aspect. This was confirmed at the review of tables during the ad-hoc group meeting.

CAA-UK (#56) states in relation with table 2 that some of the examples listed as not significant that may be independent STCs will continue to be considered as significant, in particular a “novel method of construction” was mentioned.

In the preliminary meeting this comment was rejected because the classification significant/not significant will be the same for a change to TC or STC. Subsequently, in the ad-hoc group meeting, it was found some confusion between the terms “methods of construction” that pertains to production and “principles of construction” more related with design and being one of the criteria for significant classification.

The commenter also disagrees with the wording of the last of the significant examples. This was deferred to revision by specialists. This was done at the ad-hoc meeting and the result was the re-wording of the description of the example removing the reference to “main” in relation with the rotor blades. The “notes” column was also revised for clarity.

The commenter also requests the re-consideration of the example on FLIR or surveillance cameras.

This was also deferred to specialists that discussed it in detail and finally decided not change in wording was finally introduced.

In the same table (table 3) the commenter requested clarification of “new” in “installation of a new engine”. This was also deferred to specialists but not change in wording was finally introduced.

During the ad-hoc meeting, some new examples have been added to replace those found controversial or unclear. Some of the existing ones have been modified according with the comments and to improve clarity.

In addition, further tables of examples of substantial changes have been added were available.

Appendix 2

There were four comments on appendix 2, AIA (#17, #18, #19, and #20).

AIA (#17) expresses the opinion that neither appendix 2 nor appendix 3 provide the applicant with acceptable means of compliance and provides grounds for this statement.

Both the text and examples of this appendix have been reviewed to try to clarify them. Regarding the text the most important change is the introduction of a new paragraph after the first one to clarify the intent of the whole appendix.

AIA (#18) states that the reference to “engineering judgement” may lead to lack of consistency in the implementation.

The potential problem is recognised but will be addressed by the training and harmonised implementation. No changes were introduced in the text.

It is commented also that cost-benefit equals practicality but this comment was not completely understood and consequently no changes introduced.

AIA (#19) comment that in addition to accidents, incidents/events without safety consequence are also important for determining the likelihood of the event.

This reasoning was agreed but considered implicit in the text and so no change was introduced. In this comment, similarly to the previous (#18) the commenter equals practicality to cost-benefit and this is not understood.

The commenter states that the cost estimates in the rule making apply to new type while the cost for incorporation to existing designs may be substantially higher.

This discussion was deferred to the ad-hoc group meeting and a sentence was introduced to clarify this at the end of step 6.

The commenter also states that the fleet size projections, utilization, etc... may be dramatically different due to the new rule leading to inaccuracies of these projections. The commenter also requested removal of the costs avoidance by “lost revenue” and certification costs.

This proposal was discussed and a sentence finally introduced under “step 6, cost’.

AIA (#20) request the examples to be removed and replaced by new ones consistent with the present ACJ. The existing examples were revised during the ad-hoc group meeting, and as a consequence the example 3 was removed.

The numbering of Appendix 2 has been modified to align with the draft FAA AC.

Appendix 3

No comments were received regarding appendix 3. AIA #17 pertained to both appendices 2 and 3 when stating that none of them provided acceptable means of compliance.

This comment was acknowledged also regarding appendix 3 but no change in text was introduced.

As part of the revision of examples the rotorcraft example was revised by specialists and removed.

The numbering of Appendix 3 has been modified to align with the draft FAA AC.