SUBSTANTIVE COMMENTS. Substantive comments must be resolved in the format below. Substantive comments are any comment other then those which:

- correct grammar or sentence structure
- correct spelling
- correct term use
- make simple text changes to clarify the intent, meaning or to improve readability
- change format/structure of the overall document

DISPOSITION OF THE PUBLIC COMMENT PHASE

(NOTE: Commenter, please remove samples before commenting)

DARK SHADE (last 2 columns) TO BE COMPLETED BY THE FAA

Name of Company	Name of person	Page & Para	Comment: *Similar comments may be grouped together or you may list them separately.*	Comments Accepted? 1. YES 2. NO 3. IN PART	Disposition: *Technical specialist must dispose each comment (can group similar comments) by accepting them either in part, whole or not at all. Reasons MUST be provided for NOT accepting in part or whole.*
Unifrax I LLC	Chad Garvey	page 2, par 5d	Section 25.856(b) specifies a test duration of four minutes upon which the burnthrough testing is terminated. Therefore, any of the proposed remedial testing in paragraph 5d of the draft AC cannot mathematically yield an average burnthrough time of greater than or equal to four minutes since any failed test, by definition, would be less than four minutes.	In part	The intent of this provision would obviously require tests to run longer than 4 minutes. Therefore, the current test method will need to be modified to prolong the burner exposure. While this was not explicitly stated, it is implied by the guidance. However, to make it clearer, we revised the AC to state that the test must be run longer than 4 minutes.
CEAT	Serge Le Neve	page 2, par 5d(1)	The handbook test procedure says to turn off the burner after the 4 minutes of exposure, so the burnthrough time is available only for the failed tests. So to	In part	The intent of this provision would obviously require tests to run longer than 4 minutes. Therefore, the current test method will need to be modified to prolong the burner exposure. While this was not explicitly stated, it is

			average the burnthrough time results it will be necessary to specify an extended flame time. The AC proposes to carry out a fourth test if one of the three previous tests failed. I think it may be allowed only if the test failed with a significant gap between the 2 other tests results (burnthrough time). As an example: If the test results are 260s, 240s and 210s, we cannot say that the third test results is due neither to a test problem nor to a sample problem but probably due to a material behaviour which is just close to the limit (and out of the limit). If you want to be less severe, you can accept 1 fail and calculate the average, but I don't understand why to carry-out a fourth test in that case.		implied by the guidance. However, to make it clearer, the AC will be revised to note that the test must be run longer. The provision in the AC is intended to enable an applicant to recover from a single failure that might be caused by a myriad of factors. It is not intended to be a routine occurrence. The margin of failure for the single sample might suggest that there was a manufacturing issue, and therefore an invalid test. However, there is no established margin that predicts this, and there could be other subtle variations that could cause an otherwise acceptable material to fail. By requiring that the total number of samples have an average burnthrough time of greater than 4 minutes the intent of the rule is met.
CEAT	Serge Le Neve	page 2, par 5d (2)	The AC considers the case where the fourth sample should also fail the test, and in that case the AC allows to test two additional samples. I think it should be not allowed because of the following: If the four test results are close (and close to the limit), the fourth test confirms that the material is not safe according to the current requirement. (Following the 1st example: 260s, 240s, 210s and 220s.) If two of the four first samples failed with a significant gap (as an example: 300s, 180s, 350s, 200s) that shows that the material and/or his fire behavior is not reliable. To summarize, I think a fourth test could be allowed only if there is a significant gap (to be determined) between the failed test result and the two other test results. Additional tests (fifth and sixth) should not be allowed. Extended flame time has to be	No	As noted above, the average of all samples must be included, so the case where two out of four sample sets fail is a failure, unless a total of 6 sample sets are averaged to exceed four minutes burnthrough time. If all the sample sets average to more than 4 minutes, the material should have sufficient consistency to provide the intended performance.

			specified in the test procedure.		
CEAT	Serge Le Neve	par 7d (1)(d)	The AC says (regarding the § 8-b "other means of attachments" and 8-c (1) "modification of the test fixture") : "heat flux is not measured because the ability of the material to resist heat transfer should have been demonstrated in the basic test": Do you mean that we must systematically carry out tests both in basic configuration and in modified configuration? Is it not possible to validate heat transfer behavior with the modified configuration if heat flux test results are in accordance with the requirement? (Of course I only consider this possibility for the 8-c (1) and not for the 8-c (2) (overlapping).)	In part	An applicant could propose to demonstrate the heat flux requirement in the modified fixture. However, all materials must be tested using the standard arrangement, which includes installation aspects that are important in ensuring adequate burnthrough resistance. No change was made to the AC.
Airbus		page 4, par 6d	Sound damping material should be explicitly excluded from the definition.	No	Damping material has already been established as acoustic insulation. However, we are not aware of any case where the damping material would be the only insulation present, and subject to the burnthrough requirement. If a situation arises where damping material would be subject to the burnthrough requirement, an applicant is free to coordinate this on a case-by-case basis. No change was made to the AC.
Airbus		page 4, par 6e and page A1-2 from Appendix 1, Figure 1-2	Remove "field blanket" and add the following definition: ***"Insulation Blanket: Thermal acoustic liner positioned between structural members or around them and typically fastened on the airplane structure".*** Replace the wording "Field Blanket" in the figure title by the wording "Insulation Blanket."	No	The definition is intended to distinguish blankets between frames from blankets that wrap a frame, or are used in highly specific areas. No change was made to the AC.

Airbus		page 4, par 7a(3) and page A1-7 from Appendix 1 - figures	Supplement §7a(3) "An encapsulating system incorporates a fire-resistant film cover material surrounding the batting that also acts as a fire barrier", with the following sentence: ***"This film can also be placed only on one side of the batting (that is either outboard or inboard.)"*** Supplement Appendix 1 with new ***"Figure 1-11 - Encapsulating Film System Used in Conjunction with Fiberglass,"*** to illustrate the above addition (see Attachment to Airbus Comments in last page).	In part	We revise the AC to allow for the variant discussed. With this revision figure 5 adequately addresses the configuration and no additional figure is needed.
Airbus		page 7, par 7c(2)	Modify the first sentence of §7c(2) as follows: "Certain discontinuities are unavoidable: for example, where essential systems must ~~go from the outboard to the inboard side of~~ ***penetrate*** the insulation material, and such systems cannot practically be constructed of fire-resistant material themselves […]." The wording "penetrate the insulation material" should be preferred to the wording "essential system that must go from outboard to inboard" that is not needed for the understanding of the situation.	No	This text provides an example to illustrate the concept. Making the example more generic reduces the value of the example. No change was made to the AC.
Airbus		page 8, par 7d(2) and page 10, par 7d(4)	Delete "(that is aluminium"….)" and replace with: ***"(material with a melting point > 1650°F (900°C))".***	No	The current wording reflects the way the tests were performed to develop the guidance. Applicants can propose and substantiate a different method if they choose to. No change was made to the AC.

Airbus		page 10, par 7d(4)	Complement paragraph (4) with the following sentence: "***Fasteners that penetrate only one blanket to keep it close to the fuselage skin could be made of any material (thermoplastics for example).***"	Yes	We revised the AC to reflect the intent of this comment.
Airbus		page 11, par 8	Correct the section reference according to the new AC numbering: "[…] those discussed in Section ~~6~~ ***7*** […]".	Yes	We have revised the AC to include this change.
Airbus		page 16, par 9b	Passenger doors: The FAA released a temporary guidance that only referred to insulations that are mechanically fastened. The AC introduces an additional advisory that is to test the actual configuration when the insulations are not mechanically fastened. The door structure is a massive structural part, which will retain a large quantity of fire. The incorporation of a fire barrier material that meets CFR 25.856(b) requirements when 12 inches of the door or above is in the lower half, is already a costly and significant improvement in terms of burn through protection inside the door. Airbus therefore considers that the incorporation of the fire barrier is sufficient, whether the insulation is or is not mechanically attached and proposes the following text revision: "[…] If less than 12" of the door is in the lower half of the fuselage, the insulation on the door does not need to comply with § 25.856(b). If 12" or more of the door is in the lower half, ~~and insulation is mechanically fastened,~~ ***only the insulation material should meet the requirements of § 25.856(b), and the attachment method does not need to be tested.*** ~~If the~~	In part	It was not our intent that the door structure itself be tested, and we revised the AC to clarify this. However, there are some means of attachment that would not provide a benefit, even if the material were changed to meet the rule. For example, hook and loop attachment on a surface will quickly detach. Conversely, insulation that is inserted into the structure of a web/stringer configuration, and sandwiched by an escape slide pack, would be considered sufficiently mechanically retained to not require any special testing. We also revised the AC to state "held in place," rather than "fastened" for this application.

			~~insulation is not mechanically fastened, a test of the actual configuration is being required.~~"		
Airbus		page 17, par 9d	Supplement §9d with an additional paragraph addressing the specificities of split line below the floor panels in the cockpit area when the fuselage is insulated. In the nose section, the split line is per geometry going down. Consequently, the surface of insulation material in the fuselage below the split line and above the cockpit floor is very small. A change according to CFR 25.856(b) here will not really contribute to improve the overall burn through protection. In general, Airbus also questions the benefit of modifying the insulation materials in the cockpit area according to CFR 25.856(b). Indeed, the lower half fuselage in the cockpit always gets a concentration of essential systems that penetrate the insulation materials. As these systems cannot be fire resistant, they constitute unavoidable discontinuities in the fire barrier. This results in a puzzled fire penetration protection in the cockpit, which obviously cannot be as good as in the other parts of the fuselage.	In part	We agree that some allowances are possible in the flightdeck, however, as noted in the AC, it is very difficult to generalize. Depending on the airplane geometry, an acceptable approach could vary considerably. And, while the benefits of improving the insulation below the flightdeck might not be as significant as the benefits below the passenger cabin, they are still an improvement. We have revised the AC to include this discussion of the flightdeck.
Airbus		page 16, par 9	Incorporate in the AC an additional paragraph to relax the requirements with respect to the insulated materials installed on parts that are per design already burn through resistant: Typical examples are the insulation materials falling under the applicability of CFR 25.856(b) installed on existing fire penetration resistant composite parts. Existing structural parts are sometimes made of fire penetration resistant materials	In part	The issue is more complex, since the effectiveness of any structure is not necessarily the same as would be provided by insulation that meets the rule. In addition, the transition between the structure and the area where the insulation does meet the rule would have to be addressed, and would be dependent on the specific airplane configuration and geometry. Lastly, the rule was intended to provide an additional 4 minutes protection from a post crash fire, so the effect of the existing structure was already considered when looking at the benefits. Thus, while there is potential for highly

			(like certain composite structural parts) and are insulated with materials that fall under the applicability of CFR 25.856(b). Then, a strict application of the rule leads to upgrade the flammability standard of the insulation materials (currently CFR 25.856(a) compliant), while the supporting composite part is already fire penetration resistant – in terms of CFR 25.856(b). This is overdone because a modification of the insulation materials in this case will not contribute in delaying the entry of the fire into the passenger compartment above what the composite part does. Airbus proposes the following wording: ***"Insulation materials that are installed on existing structural part which per design are fire penetration resistant do not have to comply with CFR 25.856(b)."***		fire resistant structure to be incorporated into the burnthrough protection scheme, the number of variables involved makes it impractical to provide general guidance. No change was made to the AC.
Airbus		page 17, par 10 page A2-1 from Appendix 2	Additional guidance should be provided for the development of alternative burners. Ideally, the FAA should give generic requirements for the test equipment, like the minimum performances, inputs/outputs. The FAA spent some time to develop an improved sonic burner that is repeatable and meets the requirements. However, the way the AC is written is very constraining, as it does not give other alternatives to the sonic burner. Because the sonic burner is not industrially available, an industrial alternative should be given in the AC, as follows: ***"An alternative burner shall be operated with the following parameters:*** ***Air outlet: minimum 63 standard cubic feet /minutes,*** ***Air temperature: 40° - 60° F*** ***Fuel outlet: 6 ±0,2 gal/h,***	In part	We revised Appendix 2 of the AC to include additional information regarding test methods using alternative burners. However, there are a number of empirically generated parameters that are difficult to capture globally. Depending on the type of burner an applicant wants to use, the amount of testing required to substantiate an alternative burner is extensive, and not necessarily predictable, therefore, a general discussion is provided. If another alternative is desired an applicant can make a specific proposal. No change was made to the AC.

			Fuel temperature: 5° - 10°F ***The burner shall have a cone as specified in Appendix F Part VII*** ***The burner shall be calibrated to a temperature profile according to Appendix F, Part VII and to a heat flux of >15, 2 BTU."***		
Boeing	James M. Peterson	page 4, par 6.d.	**COMMENT #1 OF 9:** We recommend that the explanation of "Thermal/Acoustic Liner" be modified by removing the second sentence, as follows: *"Thermal/Acoustic Liner. Any materials (for example, a blanket) that are used to thermally or acoustically insulate the interior of the airplane. ~~These materials are installed onto the airplane skin or other structure to form a barrier between the passenger cabin and an external fire~~. Thermal/acoustic liners consisting of batting encapsulated by a moisture barrier may be known as 'bags.'"* ***JUSTIFICATION FOR CHANGE:*** The engineering function of the installation of the thermal/acoustic materials is to provide thermal and acoustic insulation properties. Our recommended change clarifies this.	In part	We agree that the purpose of the insulation is not necessarily to form a fire barrier. However, the intent of § 25.856(b) is that the insulation that can form an effective fire barrier should do so. We have revised the AC text to clarify that the insulation is "typically" installed on the skin, and "can" form a fire barrier.
Boeing	Dan Slaton	page 4, par 7.a., Note	**COMMENT #2 OF 9:** We recommend that the Note be modified as follows: *"Variations from the representations shown in Appendix 1 of this AC that would make the installation more critical ~~(for example, increased fastener pitch) should be assessed using the fixture modifications as shown in paragraph 8 of this AC.~~ can*	In part	The intent of the Note is to provide a means of addressing configurations not already captured by the AC. The example of increased fastener pitch is valid. However, there may be other methods of addressing these issues that are different than using the modified fixture described in paragraph 8. We have revised the Note to reflect that this is one method but not the only method.

			be evaluated using test fixture alterations as needed." ***JUSTIFICATION FOR CHANGE:*** The current rule defines the standard test method and test fixture for performing certification tests. As written, the Note limits the extent to which the test fixture can be modified as needed to accommodate configuration testing. The Note also implies that the modification proposed is mandatory. Our proposed revision would help clarify this.		
Boeing	Dan Slaton	page 6, par 7.b.(2)	**COMMENT #3 OF 9:** We recommend modifying the section as follows: *"…changing the burner/test stand relationship, so that the burner flame impinges between two of the frames, and on the overlapped area, is* ***an example of*** *an acceptable method to substantiate a lesser overlap ~~(see paragraph 8c.)~~"* ***JUSTIFICATION FOR CHANGE:*** The current rule defines the standard test method and test fixture for performing certification tests. The section seems to limit other possible modifications that could be implemented to make testing of this unique configuration more appropriate for the configurations being evaluated. Our recommended change would clarify this.	Yes	Although the meaning is not different, adding the phrase makes it clearer. We have revised the AC to include the phrase suggested by the commenter.

Boeing	Dan Slaton	page 7, par 7.c.(2)	**COMMENT #4 OF 9:** We recommend that the text of this section be revised as follows: *"…The rule however does require consideration of the installation **design** methodology, so discontinuities in the insulation would not be acceptable if they are caused by the installation **design** method**ology.**"* ***JUSTIFICATION FOR CHANGE:*** Our recommended revision would provide clarity and standard interpretation of the guidance material.	Yes	We have revised the AC to include the commenter's suggestion.
Boeing	Dan Slaton	page 11 and 12, par intro	**COMMENT #5 OF 9:** We recommend revising the text to state more clearly that this section is not mandatory, as follows: *"OTHER **OPTIONAL** THERMAL/ACOUSTIC INSULATION ~~CONCEPTS~~ **COMPLIANCE METHODS.** The oil burner test described in part VII of Appendix F is intended to represent the temperature and heat flux approximately equivalent to a post-crash fire. **This section provides other acceptable means for showing compliance**. ~~The scale of the test method does not replicate the scale of an actual fire. In addition, the test stand incorporates steel components to facilitate repeated testing, and to eliate small structural details from the test setup. When materials or installation designs other than those discussed in section 6 are~~	In part	The intent of the paragraph is to explain the limitations of the standard test fixture and reinforce the need to assess those materials and installation approaches that are not adequately assessed simply using the standard fixture. Nonetheless, the approaches provided in the AC are only one way to address that situation and we revised the AC to reflect that. However, the bulk of the explanation will remain as written.

			~~*used, the standard test apparatus may not be appropriate. It is not necessarily adequate to simply incorporate a novel feature or design concept into the test sample to verify its acceptability. In some cases, larger scale testing will be required to support development of special conditions. In other cases, the test burner might be acceptable, but the test stand might require modification (for example, substitution of aluum frames for the steel frames) in order to produce valid results."*~~ ***JUSTIFICATION FOR CHANGE:*** The current rule defines the standard test method and test fixture for performing certification tests; the AC can only define alternative methods for showing compliance. The section as written implies that the modifications discussed are the only ways to accomplish testing of the specific example configurations mentioned, and any others as well. Our recommended change would clarify this.		
Boeing	Dan Slaton	page 12 and 14, pars. 8.c.(1) and (2)	**COMMENT #6 OF 9:** We recommend deleting paragraphs 8.c.(1) and (2). ***JUSTIFICATION FOR CHANGE:*** The current rule defines the standard test method and the test fixture for performing certification tests; the AC can only define alternative methods for showing compliance. The section requires that the modifications discussed are the only ways to accomplish testing of the specific example configurations mentioned. Modifications to the test fixture will only test the test fixture and not the material.	No	Given that this discussion relates to one means of showing compliance, and is not mandatory, the description of the appropriate modifications for that means is necessary. However, the AC notes that it is only describing one method, and that other methods may be acceptable. No change was made to the AC.

			Paragraphs 8.a and 8.b already allow alternative test methods of compliance. Our recommended change would clarify this.		
Boeing	Keith Couilliard	page A2-3 and A2-5, Appendix 2, pars. 5 and 8	**COMMENT #7 OF 9:** In paragraph 5, we recommend that the requirement for the air supply to be set at *"a steady pressure of at least 57 pounds per square inch gauge…."* should be changed to *"…at least* ***60 pounds****…."* Likewise, in paragraph 8, we recommend that the requirement for, *"…minimum continuous 57 psig…"* should be changed to, *"…minimum continuous* ***60 psig*** *..."* ***JUSTIFICATION FOR CHANGE:*** Our recommended changes in operation parameters reflect the latest FAA Technical Center sonic burner settings utilized. The requirement as proposed in the AC is no longer applicable. (Reference Rob Ochs' *NextGen Burner Update* presentation dated June 27, 2007.)	Yes	We have revised Appendix 2 to reflect the latest technical standard for the NexGen burner, which captures comments 7 and 9 from Boeing.
Boeing	Keith Couilliard	page A2-3, Appendix 2, par 6.	**COMMENT #8 OF 9:** We recommend that this section be revised as follows: *"The use of a mechanical pump driven by an electric motor ~~may~~* ***can be shown to*** *work~~, but has not been shown to~~* ***and*** *provide an equivalent level of performance to the pressurized fuel tank system."* ***JUSTIFICATION FOR CHANGE:*** We consider our recommended change	Yes	We have revised the AC to state that an electric pump can be made to work.

			justified, based on recent testing conducted by both at the FAA and Boeing in March and April 2007. That testing demonstrated similar test and performance results of both the Boeing and FAA alternative burners with Boeing's burner utilizing a mechanical fuel pump, and the FAA burner utilizing a pressurized fuel tank system for fuel delivery. (Reference Rob Ochs' *NextGen Burner Update* presentation dated June 27, 2007.)		
Boeing	Keith Couilliard	page A2-4, Appendix. 2, par 7.a.	**COMMENT #9 OF 9:** We recommend that this section be revised as follows: *"The fuel temperature must initially be between 32°- ~~40°F~~ **52°F**, and must not vary more than ~~5°~~ 10°F for the length of a test."* ***JUSTIFICATION FOR CHANGE:*** Our recommended change in operation parameters reflects the latest FAA Technical Center sonic burner settings utilized. The requirement as proposed in the AC is no longer applicable. (Reference Rob Ochs' *NextGen Burner Update* presentation dated June 27, 2007.)	Yes	We revised Appendix 2 of the AC to reflect the latest technical standard for the NexGen burner, which captures comments 7 and 9 from Boeing.