

DOCUMENT REVIEW LOG

1. Document No.: AC 20-155A: Industry Documents To Support Aircraft Lightning Protection Certification		2.		3. Project Lead: Lee Nguyen, AIR-100		3. Reviewing Office: FAA Field Offices		4. Date of Review: 5/22/12		5. [reserved]	
6.		7. Page and Paragraph No.:	8. Comment:	9. Reason For Comment:	10. Suggested Change:			11. [reserved]			
#											
1.	AIR-500	Global Change	Improper capitalization.		Remove capitalization in the Subject and paragraph titles except for the first letter. Use title case instead.			Agree. Action: Suggested change incorporated.			
2.	AIR-500	Global Change	Incorrect spacing.	Remove auto tab.	There should be only two spaces between the labeling of the paragraph and title.			Agree. Action: Suggested change incorporated.			
3.	AIR-500	Global Change	Missing title to references.	Missing title for reference "EUROCAE ED-84, EUROCAE ED-91, EUROCAE ED-105, etc.	Place title after each reference.			Agree. Action: Suggested change incorporated.			
4.	AIR-500	Subject Area, Page 1	Incorrect font size.		Use Arial or Times new Roman, 11pt or 12pt. in the header.			Agree. Action: Suggested change incorporated.			

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5.	AIR-500	Paragraph 1a, 1 st sentence, Page 1	Change wording.		Rewrite to read: The advisory circular (AC) will show you how to obtain Federal aviation Administration (FAA)...	Agree. Action: Suggested change incorporated.
6.	AIR-500	Paragraph 1a, 2 nd sentence, Page 1	Change wording.		Rewrite to read: We recommend you use the referenced...	Agree. Action: Suggested change incorporated.
7.	AIR-500	Paragraph 1b, 2 nd sentence, Page 1	Change wording.		Rewrite to read: ...to show you how to obtain certification for lightning protection.	Agree. Action: Suggested change incorporated.
8.	AIR-500	Paragraph 2, Page 1	Missing "Applicability" paragraph.	Non-compliance to Order 1320.46C.	The "Applicability" paragraph is a mandatory paragraph. This paragraph should always be labeled as paragraph number 2. Re-label all the other paragraphs accordingly.	Agree. Action: Applicability" paragraph is added: 2. APPLICABILITY. This AC applies to all applicants for a new type certificate (TC) or a change to an existing TC when the certification basis requires you to address the certification requirements of aircraft lightning protection. Other paragraphs are re-labeled accordingly.

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9.	AIR-500	Paragraph 3, 2 nd sentence, Page 1	Missing space.		There should be two spaces between sentences.	Agree. Action: Suggested change incorporated.
10.	AIR-500	Paragraph 3, Note Section, Page 1	Change wording.		Rewrite to read: The industry documents referenced in this AC refer to the current revisions and amendments, or revisions and amendments accepted by regulatory authorities.	Agree. Action: Suggested change incorporated. Also, see resolution to comment 22.
11.	AIR-500	Paragraph 5, Page 2	Change wording of title.		Rewrite to read: Related Documents.	Agree. Action: Suggested change incorporated.
12.	AIR-500	Paragraph 5a, 1 st sentence, Page 2	Improper capitalization.	Non-compliance to AGC memo sent on 1/24/94.	Remove the capitalization from the term "parts".	Agree. Action: Suggested change incorporated.
13.	AIR-500	Paragraph 5a, 2 nd sentence, Page 2	Change wording.		Rewrite to read: You can also get copies from the Government Printing Office (GPO) website at www.access.gpo.gov/ .	Agree. Action: Suggested change incorporated.

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14.	AIR-500	Paragraph 5b, 1 st sentence, Page 3	Outdated information and missing FAA website for ACs.	We do not print or stock our documents anymore,	Delete first sentence with ordering information. Rewrite to read: You can view and download copies from our web based regulatory and Guidance Library (RGL) at www.airweb.faa.gov/rl . On the RGL website, select "Advisory Circular", then select "By Number". AC are also available on the FAA website at http://www.faa.gov/regulations_policies/advisory_circulars/ .	Agree. Action: Suggested change incorporated.
15.	AIR-500	Paragraph 5b, Note Section, Page 3	The term "advisory circular" has already been defined in paragraph 1.		Use the acronym "AC".	Agree. Action: Suggested change incorporated.
16.	AIR-500	Paragraph 5c(1) & (2), Page 3	Incorrect alignment.		Place the labeling of subsections (1) and (2) directly under the first term in the paragraph title.	Agree. Action: Suggested change incorporated.
17.	AIR-500	Paragraph 5c(2), Page 3	Incorrect format.		Define the title of the reference at the first usage.	Agree. Action: Suggested change incorporated.

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18.	AIR-500	Signature Block, Page 3	Incorrect spacing.			There should be five spaces between the last paragraph and signature block.	Agree.	Action: Suggested change incorporated.			
19.	AIR-500	Signature Block, Page 3	Incorrect alignment.			Move the title "Division" directly under the title "Manager".	Agree.	Action: Suggested change incorporated.			
20.	ANM-140L ES	Pg 2, Section 4	Suggest the FAA <u>Aircraft Lightning Protection Handbook</u> be added to the Additional Helpful References section.	The FAA Aircraft Lightning Protection Handbook is a very useful document when determining lightning compliance and may be referenced in some of the other documents, but it would be useful to have it listed here because of its extensive use.		Suggest something like this: Add para c. to Section 4: "c. Additionally, you may find FAA Technical Report DOT/FAA/CT-89/22, <i>Aircraft Lightning Protection Handbook</i> , useful in your compliance showing."	Agree.	Action: Revised and added the suggested paragraph as: You may use FAA Technical Report DOT/FAA/CT-89/22, Aircraft Lightning Protection Handbook, to help you show compliance for aircraft lightning protection.			
21.	Khailaa Hosny ACE-118C, 847-294-7134	Page 1, par 1 a,&b	The AC is not mandatory and does not constitute a regulation. It describes an acceptable means, but is not the only means, to show how to gain certification for lightning. It would be more important for an applicant to understand the specific lightning policy requirement, and not to refer him to a significant amount of documents, that he needs to purchase.	In spite of this statement, which is written in each AC, the AC has traditionally been used by the FAA as a policy requirement. The AC refers to a huge amount of education material and is not specific about showing compliance of products, parts, etc., to the lightning policy requirement.		I suggest, restructuring the AC in such a way to reference the specific FAR Parts for "lightning" regulation requirement, and provide a simple diagram to identify a typical example of the certification process, then reference the applicable SAE guidance to each of those steps. This would simplify and clarify the requirement, and encourage the applicant to discuss the subject objectively into how it relates to safety, and how the documents relate to each other, without constraining free thinking and innovations.	Disagree.	AC 20-155 (with the same structure as proposed AC 20-155A) and its referenced documents have been used as methods of compliance to aircraft lightning protection requirements. Paragraph 3 of the AC describes the relevant industry documents and guidance on the applicable lightning subjects used to support certification lightning protection for aircraft structure and fuel, electrical and electronics systems. These documents help the applicant show compliance with the regulatory requirements of aircraft			

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					<p>lightning certification, but they don't describe detailed means of compliance for lightning protection. The referenced documents also contain useful background information. For example, ARP5412(), <i>Aircraft Lightning Environment and Related Test Waveforms</i>, contains information on Natural lightning description and Lightning interaction with aircraft. The information provides the background on supporting rationale for the lightning environments specified in the lightning protection requirements.</p> <p>As discussed in the referenced industry documents, they clearly describe guidance materials that can be used to help show compliance to different aircraft lightning protection requirements. For example, SAE ARP5416 (or EUROCAE ED-105), <i>Aircraft Lightning Test Methods</i>, describes test methods and test procedures to evaluate lightning effects on aircraft structure, components, electrical and electronic systems, and fuel systems. These documents can be used for compliance on 14 CFR § 23.867, Electrical bonding and protection against lightning and static electricity, § 25.581, Lightning protection, etc., where there is no FAA AC for these regulations. ARP5416 / EUROCAE ED-105 also provides a good path for compliance to § 23.954, Fuel system lightning protection, etc. since AC 20-53B (Protection of Aircraft Fuel Systems Against Fuel Vapor Ignition Caused by Lightning) does not currently refer to ARP5416.</p>

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						<p>ARP5416/EUROCAE ED-105 can also be used to show compliance to §§ 23.1306, 25.1316, 27.1316, and 29.1316, Electrical and electronic system lightning protection. ARP5412 (or EUROCAE ED-84), <i>Aircraft Lightning Environment and Related Test Waveforms</i>, describes lightning waveforms that you may use for lightning tests and analysis to support certification of aircraft structure and systems that are required to be protected from lightning.</p> <p>In addition, there are other ACs (e.g. AC 20-136B, AC 20-53B) offering more detailed means of compliance for lightning protection as discussed in paragraph 4 of the AC.</p> <p>There is no need restructure this AC. Restructure the AC would change its intent, which is to help the applicant show compliance (not to show compliance) with the aircraft lightning protection requirements.</p>	
22.	ACE-119W	Page 1, Para 3, NOTE	General	How does the applicant determine which revisions or amendments are accepted by the regulatory authorities? We thought the AC was supposed to identify the accepted revision of industry standards.	Inform applicants how to identify the accepted revisions	<p>Agree. Current revisions and amendments are accepted.</p> <p>Action: Note changed to:</p> <p>NOTE: The industry documents referenced in this AC refer to the current revisions and amendments.</p>	

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23.	Khailaa Hosny ACE-118C, 847-294-7134	Page-2, Section 1.b.	The statement "However, if you use the means described in this AC, you must follow it in all important respects." does not apply as those "Guidance" documents are more leaning towards education, and as reference material, and not a specific way for compliance.	The statement may encourage applicants to blindly follow some sections of these documents, without knowing what they are doing.	Delete: "However, if you use the means described in this AC, you must follow it in all important respects."	Agree. Action: Sentence deleted.
24.	Surinder Sangha ACE-117C, 847-294-7010	Page 2 Section 4	Missing 14 CFR Reference.	No CFR reference.	Add paragraph 4 c to add 14 CFR regulation 23.1306, 25,1316, 27.1316 and 29.1316: Electrical and electronic system lightning protection.	Disagree. Paragraph 4c addresses additional helpful references such as other ACs or standards, not regulation applicability.