Originating Office: AIR-130	Document Description: FAA AC 20-162A 162A "Airworthiness Approval of Installed Passive Ultra High Frequency (UHF) Radio Frequency Identification (RFID) Tags"	Project Lead/Reviewer Lee Nguyen	Reviewing Office:	Date of Review: February 2016

Commenter	PAGE & PARA NO:	COMMENT:	REASON:	RECOMMENDATION:	DISPOSITION:
1. GAMA	General	Some instances of the verb "must" within this draft AC do not seem to be based on a clear regulatory requirement. FAA Order 1320.46D, *FAA Advisory Circular System*, is applicable to "…anyone who prepares and issues ACs" (ref. Chapter 1 paragraph 2). Order 1320.46D Chapter 3 paragraph 7.f states: "f. Use "must" to convey regulatory requirements. … "Must" clearly conveys a requirement." The Office of Management and Budget (OMB), *Bulletin for Agency Good Guidance Practices* (72 FR 3432), Section II.2.g and II.2.h further clarify that (emphasis added; *italics* in original): "2. *Standard Elements:* Each significant guidance document shall: … g. Include the citation to the statutory provision or regulation (in Code of Federal Regulations format) which it applies to or interprets; and h. Not include mandatory language such as "shall," "must," "required" or "requirement," unless the agency is using these words to describe a statutory or regulatory requirement, …" (Note: These OMB *Bulletin for Agency Good Guidance Practices* principles are acknowledged by FAA Order 8100.16	It is important to maintain consistency with Order 1320.46D and OMB *Good Guidance Practices* (GGP). Additionally, it is important for the AC to be internally consistent with respect to the use of "must". An example use of "must" that is consistent with the aforementioned documents is included in the following from paragraph 8.1.1.2 because it clearly references the CFR that is the basis for using "must": "When using passive RFID tags for part marking of aircraft, engine, or propeller critical or life-limited components, those tags must comply with the requirements of 14 CFR 45.15 or 45.16." Examples of "must" that are not consistent with the aforementioned documents are included in the Recommendation.	In accordance with OMB *Good Guidance Practices* (GGP) Section II.2.g and Order 1320.46D Chapter 3 paragraph 10.a, which states: "a. Place references in the text where they will be most useful" It is suggested to include all regulatory requirement references where the AC is using "must" to convey a regulatory requirement. Such references will enable the reader to connect the appropriate regulatory requirement and to indicate the basis for the AC using the verb "must". In accordance with OMB GGP Section II.2.h, if a clear regulatory requirement cannot be referenced, change "must" to "should". Example paragraphs where the regulatory basis for using the word "must" is not readily apparent include but are not necessarily limited to (emphasis added): • 8.1.2: "They must be addressed in a specific certification plan." • 8.2: "Passive RFID tags must meet the requirements of SAE AS5678A." • 8.2: "Passive RFID tags data must meet A4A Spec 2000, chapter 9-5, revision 2013.1." • 9.1: "When using passive RFID tags for part marking, the record that contains identification data from the RFID tags must not be changeable." • 9.8: "The adhesive or means of attachment of the passive RFID tags must be included in the flammability testing as part of meeting the	We thank you GAMA for taking the time to review and comment on the draft AC 20-162A. **Accepted.** Changed "must" to "should" per Order 1320.46D Chapter 3 paragraph 10.a. For example, changed "must" to "should" in the following paragraphs: • Paragraph 8.1.2: "They should be addressed in a specific certification plan." • Paragraph 8.2: "Passive RFID tags should meet the requirements of SAE AS5678A." • Paragraph 8.2: "Passive RFID tags data should meet A4A Spec 2000, chapter 9-5, revision 2013.1." • Paragraph 9.1: "When using passive RFID tags for part marking, the record containing identification data from the RFID tags should not be changeable." • Paragraph 9.8: "The adhesive or means of attachment of the passive RFID tags should be included in the flammability testing as part of meeting the flammability requirements." • Paragraph 9.9: "The installed passive RFID tag should be permanently affixed to aircraft parts using approved adhesives, methods and processes." • Paragraph 9.10.1: "If passive RFID tags are installed under a supplemental type certificate (STC), then the applicant should document the RFID's ICA in the applicable ICA section of the STC. If the passive RFID tag has a service life limit, then the applicant should state the mandatory replacement limit in the ICA, see 14 CFR 43.10. The applicant should state if and when the passive RFID tag requires any other periodic

		Chapter 2 paragraphs 2-2 and 2-2.c.)		flammability requirements." • 9.9: "The installed passive RFID tag must be permanently affixed to aircraft parts using approved adhesives, methods and processes." • 9.10.1: (four instances) "If passive RFID tags are installed under a supplemental type certificate (STC), then the applicant must document the RFID's ICA in the applicable ICA section of the STC. If the passive RFID tag has a service life limit, then the applicant must state the mandatory replacement limit in the ICA, see 14 CFR 43.10. The applicant must state if and when the passive RFID tag requires any other periodic maintenance. The applicant must state whether the passive RFID tag, if malfunctioning, should be removed from the aircraft and replaced with one of the same type and configuration." Additional specific comments on other instances of "must" are provided below.	maintenance. The applicant should state whether the passive RFID tag, if malfunctioning, should be removed from the aircraft and replaced with one of the same type and configuration."
2. GAMA	Para 1, page 1	Paragraph 1 includes: "This AC is not mandatory and does not constitute a regulation. This AC describes an acceptable means, but not the only means, to comply with these requirements. However, if you use the means described in this AC, you must follow it in all important aspects. The term "must" is used to indicate mandatory requirements when following the guidance in this AC. The term "should" is used to indicate that the guidance is recommended, but not required, to comply with this AC."	We applaud this AC for basing the first three quoted sentences, i.e.: "This AC is not mandatory … if you use the means described in this AC, you must follow it in all important aspects." on the standard text specified in FAA Order 1320.46D paragraph 6.a.(2). We also applaud the FAA for including definitions for what "must" and "should" mean with the AC. However, the Recommendations include suggested revisions for these definitions.	With respect to the first three quoted sentences, we would encourage the FAA to train others that FAA Order 1320.46D paragraph 6.a.(2) specifies the standard text to be used within all ACs. With respect to the definitions of "must" and "should", we recommend use of the text in the table included as an attachment at the end of the comment log table. We further recommend that the FAA standardize inclusion of these definitions within all ACs via an update to Order 1320.46D.	**Acknowledged.** The intent of the cited statements in paragraph 1 addresses the text in the table at the end of the comment log table. Clarified the language of the sixth sentence in paragraph 1 and adopted the text in the table at the end of the comment log table as follows: "The term "must" is used to indicate mandatory requirements driven by regulation when following the guidance in this AC." We forwarded your recommendation on updating Order 1320.46D to AIR-500.
3. GAMA	8.1.1.2	The statement that those tags (for critical or life-limited parts) "must comply with the requirements of 14 CFR 45.15 or		Since RFID part marking is not an acceptable alternative to traditional marking, remove requirement to comply with 14 CFR 45.15, 16	**Partially Accepted.**

		45.16" is in contradiction to the statement in 8.1.1, "passive RFID part marking is not an alternative to meeting the part marking requirements of 14 CFR 45.15 or 45.16."		using the tags.	Passive RFID part marking is not an alternative to meeting the part marking requirements implemented by airworthiness regulations (14 CFR 45.15 or 45.16). Kept paragraph 8.1.1. Since there are redundant sentences between paragraphs 8.1.1.1 and 8.1.1.2, revised paragraphs 8.1.1.1, 8.1.1.2 and combined them into one paragraph as described in disposition to comment 34.
4. GAMA	8.1.1.2	This requirement for tags to meet 45.15/16 is unclear.	The referenced requirement says to "permanently and legibly mark ", whereas an RFID tag may not have markings (unless it is of the integrated nameplate type of section 8.1.1.3 of this draft AC). Does this guidance in 8.1.1.2 imply that RFID tags on critical or life-limited components must be of the integrated nameplate variety? Additionally, is the intent that the RFID tag meet the other requirements of 45.15/16 (e.g., serial number) in the same manner as the primary part marking? In other words, does the guidance imply that the identification information on both RFID and human readable identification match?	Provide more specific comments on what parts of 45.15/16 may be applicable (e.g., must include serial number) or remove the reference altogether, especially in light of comment 1.	**Accepted.** Revised paragraphs 8.1.1.1, 8.1.1.2 and combined them into one paragraph (see disposition to comments 3 and 34). Identified the marking requirements of 14 CFR 45.15(a)(2), (a)(3), and (a)(4) as follows: 8.1.1.1 **Ancillary Part Marking.** We consider the passive RFID tags and data ancillary if they are performing a non-required, non-essential function. When using passive RFID tags for part marking of aircraft, engine, or propeller critical or life-limited components, those tags should include digital data described in 14 CFR Parts 45.15(a)(2), (a)(3), (a)(4), and 45.16. A part number "roll" or change is not required on parts, components and/or appliances for the installation of passive RFID tags. Renumbered current paragraph 8.1.1.2 as 8.1.1.3. (See disposition to comment 34)
5. GAMA	Sect. 8.3	The stipulation of "revision 2013.1" may be too specific and require monitoring of Spec 2000. Alternatively, each revision of Spec 2000 Chapter 9-5 would require a revision to AC 20-162.		It is recommended that the text "must meet A4A Spec 2000, Chapter 9-5, revision 2013.1." be replaced by "must meet the latest revision of A4A Spec 2000, chapter 9-5."	**Accepted.** Changed paragraph 8.3 to adopt the recommendation; also replaced "must" with "should" as follows: "Passive RFID tags data should meet the latest revision of A4A Spec 2000, chapter 9-5."

6. GAMA	9.2	Application of 4761	The intended application of 4761 or safety assessment processes is unclear as a whole when applied specifically to the tag. The RFID tags themselves are intended to be an ancillary means of identification to facilitate faster and easier logging of part and serial number data along with specific use data as part of maintenance process that an OEM will elect to invoke. The safety assessment, if it were to be applied should be targeted at the function/process of maintaining configuration control of installed equipment, or for other purposes. The tags themselves are part of an overall model of implementation. The current language is singling them out without addressing the overall system by which RFID tags may be an employed method…and again by rule are to be ancillary only.	Keep existing wording in original version of the AC.	**Accepted.** Replaced paragraph 9.2 with existing wording in AC 20-162 as follows: "Assess the installed passive RFID system safety according to14 CFR 23, 25, 27, or 29.1309, 33.28, 33.75 and/or 35.23. Identify the hazard levels associated with installing and using the passive RFID system. Determine the maximum acceptable levels of "probability of failure" for the system as installed on the aircraft. Show that the system complies with safety objectives. Your safety analysis of the design and installation of passive RFID systems/devices should demonstrate that normal operation, failures, or malfunctions will not have greater adverse impact than "minor effect" according to AC 23.1309-1, *Equipment, Systems, and Installations in Part 23 Airplanes,* AC 25.1309-1, *System Design and Analysis,* AC 27-1, *Certification of Normal Category Rotorcraft* or AC 29.2, *Certification of Transport Category Rotorcraft.*"
7. GAMA	Para 9.7, page 5	Paragraph 9.7 includes: "The flammability requirements in SAE AS5678A, Section 6.3.5 apply to passive RFID tags used for part marking of critical component or life-limited parts, and components."	The placement of the quoted statement from paragraph 9.7 seems out of context given that paragraph 9.8.1 covers flammability testing for "critical component or life-limited parts" and paragraph 9.8.2 covers flammability testing for "ancillary parts".	Move the quoted statement in paragraph 9.7 into 9.8.1 or a subparagraph of 9.8.1. Since we do not have a copy of SAE AS5678A, it is unclear whether there are environmental qualification aspects of Section 6.3.5 other than flammability. If Section 6.3.5 only covers flammability testing, then it seems like paragraph 9.7 can be deleted after moving the quoted statement.	**Partially Accepted.** The referenced SAE AS5678A, Section 6.3.5 addresses additional environmental qualification other than flammability. Kept the first sentence in paragraph 9.7 "Qualify passive RFID tags according to SAE AS5678A, Section 6.3.5." Replaced the second sentence in paragraph 9.7 as follows: "Paragraph 9.8.1 in this AC provides guidance on flammability requirements for passive RFID tags used for part marking of critical or life-limited components." SAE AS5678A can be ordered from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001. Telephone (724) 776-4970, fax

					(724) 776-0790. You can also order copy online at www.sae.org.
8. GAMA	Para 9.8.1.1 and 9.8.1.2 page 5	Paragraph 9.8.1.1 includes the following text: "All tags with a longest dimension greater than 50 mm must comply pursuant to the flammability requirements specified in SAE AS 5678A, Table 3 and 14 CFR 25.853(a), and Appendix F part 1 paragraph (a)(1)(ii)." Paragraph 9.8.1.2 includes the following text: "All tags with a longest dimension less than 50 mm must comply pursuant to the requirements specified SAE 5678A, Table 3 and 14 CFR 25.853(a) and Appendix F part 1 paragraph (a)(1)(v)."	There are multiple issues with these statements: A) 14 CFR 25.853 and Appendix F part 1 are specific to part 25 aircraft. But the audience identified in paragraph 2 of this AC is for (emphasis added): "… manufacturers and modifiers of aviation products and equipment who want to install passive RFID tags on 14 CFR parts 23, 25, 27, 29, 33, and 35 aircraft, aircraft engines, propellers, parts, and components thereof." It is unclear why RFID tags installed on parts 23, 27, 29, 33, and 35 would need to meet regulations specific to part 25. B) 14 CFR 25.853 and Appendix F part 1 are specific to compartment interiors. But the purpose specified in paragraph 1 of this AC is to provide: "… guidance for installing and using passive radio frequency identification (RFID) tags on aviation products and equipment." Avionics products and equipment are often located outside the compartment interior. So, it is unclear why RFID tags located outside the compartment interior would need to comply with SAE AS 5678A, Table 3 and 14 CFR 25.853(a), and Appendix F part 1.	Determine whether there are other applicable regulations. Appropriately limit what "must" be accomplished based on the regulations that are applicable by 14 CFR part and by where the RFID tag is located. e.g., if 14 CFR 25.853 and Appendix F part 1 are the only applicable regulations, preface the existing text with something like: "For RFID tags installed in 14 CFR part 25 aircraft compartment interiors, …"	**Accepted.** A) For parts 23, 27, 29, 33, and 35, we have reviewed the test criteria of Part 25, Appendix F, Part I and determined that parts/materials tested to the Part 25 test criteria are acceptable data to show compliance with the flame-resistant material requirement of 14 CFR 23.853, 23.865, 27.853, 27.861, 29.853 and 29.861. B) We have determined that the flammability criteria in the regulation of 14 CFR 25.853 and Appendix F, Part 1 also apply to RFID tag applications outside the aircraft compartment interior due to the following reasons: 14 CFR 25.865, *Fire protection of flight controls, engine mounts, and other flight structure*, and 25.869 (a)(2), *Fire protection: systems*, govern flammability requirements for parts/materials of equipment and systems in the aircraft located outside the compartment interior. These requirements do not address specific flammability criteria. To comply with the regulatory requirements of 14 CFR Part 21.21(b)(1) that reads: "…. any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety", flammability criteria must be available for parts/materials of aircraft equipment and systems located outside the compartment interior. We have determined that 14 CFR 25.853 and Appendix F, Part 1 provide acceptable flammability criteria for parts/materials of aircraft equipment and systems

					exterior to the compartment interior. Action: Added the following note after paragraph 9.8.1.2 in the draft AC: "**Note:** 14 CFR 25.865, *Fire protection of flight controls, engine mounts, and other flight structure*, and 25.869 (a)(2), *Fire protection: systems*, govern flammability requirements for parts/materials of equipment and systems in the aircraft located outside the compartment interior. These requirements do not address specific flammability criteria. To comply with the regulatory requirements of 14 CFR Part 21.21(b)(1) that reads: "…. any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety", the FAA has determined that 14 CFR 25.853 and Appendix F, Part 1 provide acceptable flammability criteria for parts/materials of aircraft equipment and systems exterior to the compartment interior."
9. GAMA	Para 9.8.2, page 5	Paragraph 9.8.2 includes: "Passive RFID tags used for ancillary part marking must meet the flammability requirements of RTCA/DO-160, Section 26."	There is no clear regulatory basis identified for the use of "must" in the quoted text.	If there is a clear regulatory requirement for using "must", reference the regulatory requirement and indicate that RTCA/DO-160 provide an acceptable means to meet the regulations (see the general comment on use of "must" for additional information). Otherwise, change "must" to "should".	**Accepted.** Changed "must" to "should" in paragraph 9.8.2 as follows: "Passive RFID tags used for ancillary part marking should meet the flammability requirements of RTCA/DO-160, Section 26."
10. DAL, Jon Andresen	8.1.1.1	**8.1.1.1** Marking of Critical and Life-limited parts When using passive RFID tags for primary or non-redundant part marking of critical or life-limited components, those tags must comply with the requirements of 14 CFR 45.15 or 45.16. *Discussion: If the RFID tag is the only*			We thank you Delta Air Lines and Jon Andresen for taking the time to review and comment on the draft AC 20-162A. **Accepted.** The term "non-redundant" is equivalent to ancillary, or as supplement, but not to replace the original part marking.

		part mark it would be considered "non-redundant" since the information is not also available on an existing OEM data plate part mark or an Integrated Nameplate per 8.1.1.3 below. The terms 'Critical' and 'Life-Limited" should be clarified related to "time-controlled" and this section should include examples of equipment that is typical in each category. Many operators would like to apply RFID tags but need clarity on which items qualify in this section.			Added the following definitions to the end of paragraph 8.1.1.1: In this AC, the following definitions apply: Life-Limited Parts: Life-limited or time-controlled parts and/or components are defined and designated during the certification process and the results are mandatory replacement limits specified either in the type design, Instructions for Continued Airworthiness (ICA), or the Aircraft Maintenance Manual. As specified in the type certificate, they may not exceed a specified time, or number of operating cycles in service. The type certificate for an aircraft, engine, or propeller either calls out the mandatory replacement limit for parts specifically within the content of the type certificate or it may refer to another document that calls out the limitations. The limits and status are characterized by either accumulated cycles, hours, or any other mandatory replacement limits of the life-limited part. The replacement limits are a mandatory replacement limit and not a recommended replacement limit. Critical Parts: They are manufactured parts for which a replacement time, inspection interval, or related procedure is specified in the Airworthiness Limitations section of a manufacturer's maintenance manual or ICA. The part must be permanently and legibly marked with a serial number (or equivalent), unique to that part in addition to any other applicable requirements. It indicates that a part and/or component has been identified as critical by the design approval holder during the product type design validation process, or

					otherwise by a civil aviation exporting authority. Also, there are components that contain parts for which a replacement time, inspection interval, or related procedures that are specified in the Airworthiness Limitations section or Certification Maintenance Requirements of the manufacturer's maintenance manual or ICA.
11. DAL, Jon Andresen	8.1.1.2	8.1.1.2 Integrated Nameplate An integrated nameplate is an identification or part marking that contains an embedded RFID chip or device that may be utilized in the same manner as other identification and markings as shown in 14 CFR 21.182 and part 45, subpart B. The human readable portion of the integrated nameplate must conform to the regulatory requirements in 14 CFR 21.182 and part 45, subpart B. The RFID enabled or barcoded segment of the integrated nameplate may contain the same part identification information (for example, part birth record elements as defined in Airlines for America (A4A), formerly known as Air Transport Association of America, Inc. (ATA), Spec 2000 encoded in digital and printed in text and barcoded formats). The human readable or barcoded segment will act as the primary part marking and the RFID-enabled segment is still considered ancillary part marking. Failure of the integrated nameplate's embedded RFID chip is subject to the Safety Assessment described in paragraph 9.2.	*Discussion: The typical integrated Nameplate will contain three elements – human readable, 2D barcode and RFID. While the human readable element of the tag is considered the primary part mark, a 2D barcode or an RFID element can be used in conjunction with the primary marking reference- Federal Register /Vol. 74, No. 199 / Friday, October 16, 2009 /Rules and Regulations pg 53371 (see http://www.faa.gov/aircraft/air_cert/production_approvals/14cfr_amendments/media/faa-2006-25877.pdf)*		**Not Accepted.** The AC is directed to airworthiness guidance for installations of RFID tags or devices, not barcodes. Barcodes are considered line-of-sight technology only. RFID technology does not require line-of-sight and provides read, write, modify, and update capability. RFID data can be encrypted; passwords protected, or include a "kill" feature to remove data permanently, so information stored is much more secure when compared to barcodes.
12. DAL, Jon Andresen	8.1.1.3	8.1.1.3 Ancillary Part Marking Passive RFID tags and data can be considered ancillary if providing redundant part identification data or information not considered as Primary	*Discussion: This would apply to tags that carry redundant part marking information in addition to the part marking supplied by the OEM (or applied by the current operator PAH et per c). The original Ancillary entry excluded items that were identified via RFID tag*		**Not Accepted.** Paragraph 8.1.1.3 is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and

		Part Marking or identification per 14 CFR 45.15 or 45.16. Passive RFID tag part marking is not considered ancillary when critical or life-limited components use only the RFID tag to carry the part marking (ref 8.1.1.1).	*as 'life-limited or critical'. This is a requirement in spec2000 9-5 for all multi/dual/single record tag types, but not for the utility tag. If the tags use a 'license plate' unique identifier that associates the tag to a part using a' record-keeping system' referenced in 14 CFR 43.10 they may be considered as 'RFID tags performing other functions' and not ancillary use?*		appliances only. This AC does not address operational guidance for RFID tags used for aircraft configuration control, record keeping, aircraft maintenance and dispatch activities.
13. DAL, Jon Andresen	8.1.2	8.1.2 RFID Tags that perform other functions Passive RFID tags that perform other functions may be attached to components as part of a record-keeping system per14 CFR 43.10. These tags may contain information other than part marking identification per 14 CFR 45.15 or 45.16 or may include various birth record elements as defined in A4A Spec2000. They may be used to record or reference certain attributes in a record-keeping system such as part install location, part number, airline stocking number, FFFC, manufacture date, expiration date or other data elements specified in ATA spec2000. These tags should conform to the RFID encoding, text or barcoded elements as defined in the current version of A4A Spec2000. Evaluate passive RFID tags that perform other functions to determine any adverse effects from the tag installation and function. Address those considerations, including loss of tag data integrity, in your system safety assessment. Passive RFID tag functions with adverse effects that could cause catastrophic, hazardous/severe-major, or major failure conditions are outside the scope of this AC. They must be addressed in a specific certification plan.	*Discussion: This section applies to RFID tags that perform other functions- for example, to identify components in a record-keeping system. This system may contain part information or other data elements that facilitate tracking for presence, expiration or other needs. This information can be gathered from the component using the approved part marking human readable, barcoded or RFID data elements. If the RFID tags installed by an OEM on a component do not have the performance characteristics needed by an operator (read distance, memory size), an "other functions" (inventory tracking?) RFID tag could be added and the original part information collected from the OEM part marking and recorded in a record-keeping system, along with details like aircraft, installed location, visit scheduling attributes that allow integration with other systems etc.*		**Not Accepted.** (See disposition to comment 12) This AC is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and appliances only. This AC does not address operational guidance for RFID tags used for aircraft configuration control, record keeping, aircraft maintenance and dispatch activities.

14. DAL, Jon Andresen	8.2	Add 'or tags that perform other functions' along with Ancillary part marking tags to the exclusion for data retention.			**Not Accepted.** (See disposition to comment 12) This AC is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and appliances only. This AC does not address operational guidance for RFID tags used for record keeping, supply chain or activities.
15. DAL, Jon Andresen	8.3	Refer to spec2000 Chapter "current revision" instead of specific rev and date.			**Accepted.** Changed specific rev and date to the "current revision". (See disposition to comment 5)

16. DAL, Jon Andresen	9.3	Add 'or RFID tags that perform other functions' along with Ancillary part marking tags.			**Not Accepted.** (See disposition to comment 12) This AC is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and appliances only. This AC does not address operational guidance for RFID tags used for record keeping, supply chain or activities.
17. DAL, Jon Andresen	9.8.2	Add section 8.1.1.4 statement - 'or tags that perform other functions' to reference for Ancillary part marking tags.			**Not Accepted.** (See disposition to comment 12) This AC is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and appliances only. This AC does not address operational guidance for RFID tags used for record keeping, supply chain or activities.
18. Jon Andresen	General	This AC does a good job on highlighting the difference between primary and ancillary part mark requirements.			**Acknowledged.**
20. AAL	8.1.1.1	*If the RFID tag is the only part mark it would be considered "non-redundant" since the information is not also available on an existing OEM data plate part mark or an Integrated Nameplate per 8.1.1.3 below. The terms 'Critical' and 'Life-Limited" should be clarified and this section should include examples of equipment that is typical in each category. Many operators would like to apply RFID tags but need clarity on which items qualify in this section.*			We thank you American Airlines for taking the time to review and comment on the draft AC 20-162A. (See disposition to comment 10) **Accepted.** The term "non-redundant" is equivalent to ancillary, or as supplement, but not to replace the original part marking. Added the following definitions to the end of paragraph 8.1.1.1: In this AC, the following definitions apply:

					Note: In this AC the following definition s apply: Life-Limited Parts: Life-limited or time-controlled parts and/or components are defined and designated during the certification process and the results are mandatory replacement limits specified either in the type design, Instructions for Continued Airworthiness (ICA), or the Aircraft Maintenance Manual. As specified in the type certificate, they may not exceed a specified time, or number of operating cycles in service. The type certificate for an aircraft, engine, or propeller either calls out the mandatory replacement limit for parts specifically within the content of the type certificate or it may refer to another document that calls out the limitations. The limits and status are characterized by either accumulated cycles, hours, or any other mandatory replacement limits of the life-limited part. The replacement limits are a mandatory replacement limit and not a recommended replacement limit. Critical Parts: They are manufactured parts for which a replacement time, inspection interval, or related procedure is specified in the Airworthiness Limitations section of a manufacturer's maintenance manual or ICA. The part must be permanently and legibly marked with a serial number (or equivalent), unique to that part in addition to any other applicable requirements. It indicates that a part and/or component has been identified as critical by the design approval holder during the product type design validation process, or otherwise by a civil aviation exporting authority. Also, there are components that contain parts for which a replacement time, inspection interval, or related procedures that are specified in the Airworthiness Limitations section or Certification

					Maintenance Requirements of the manufacturer's maintenance manual or ICA.
21. AAL	8.1.1.2	*The typical integrated Nameplate will contain three elements – human readable, 2D barcode and RFID. While the human readable element of the tag is considered the primary part mark, a 2D barcode or an RFID element can be used in conjunction with the primary marking reference-* ***Federal Register*** */Vol. 74, No. 199 / Friday, October 16, 2009 /Rules and Regulations pg 53371 (see http://www.faa.gov/aircraft/air_cert/production_approvals/14cfr_amendments/media/faa-2006-25877.pdf)]*			(See disposition to comment 11) **Not Accepted.** The AC is directed to airworthiness guidance for installations of RFID tags or devices, not barcodes. Barcodes are considered line-of-sight technology only. RFID technology does not require line-of-sight and provides read, write, modify, and update capability. RFID data can be encrypted; passwords protected, or include a "kill" feature to remove data permanently, so information stored is much more secure when compared to barcodes.
22. AAL	8.1.2	*This section discusses RFID tags that perform other functions, used to identify components in a record-keeping system. This system may contain part information or other data elements that facilitate tracking for presence, expiration or other needs. This information can be gathered from the component using the approved part marking human readable, barcoded or RFID data elements. If the RFID tags installed by an OEM on a component do not have the performance characteristics needed by an operator, an "other functions" (inventory tracking?) RFID tag could be added and the original part information pulled from the OEM part marking and recorded in a record-keeping system, along with details like aircraft, installed location, visit scheduling attributes that allow integration with other systems etc.*			**Not Accepted.** (See disposition to comment 12) This AC is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and appliances only. This AC does not address operational guidance for RFID tags used for record keeping, supply chain or activities.
23. AAL	8.2			Recommend changes as shown in red: Passive RFID tags must meet the requirements	(See disposition to comments 12 and 14)

				of SAE AS5678A. Passive RFID tags used for ancillary part marking or tags that perform other functions don't have to meet the requirements of paragraph 6.4, Data Retention Life Expectancy, in AS5678A.	**Not Accepted.** This AC is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and appliances only. This AC does not address operational guidance for RFID tags used for record keeping, supply chain or activities.
24. AAL	8.3			Recommend changes as shown in red: Passive RFID tags data must meet the current version of A4A Spec 2000, chapter 9-5.	(See disposition to comment 15) **Accepted.** Changed specific rev and date to the "current revision".
25. AAL	9.3			Recommend changes as shown in red: This requirement applies to passive RFID tag installations that perform critical component/life-limited part marking or "other" functions. This requirement does not apply to passive RFID tag installations that perform ancillary part marking or tags that perform other functions.	(See disposition to comment 16) **Not Accepted.** This AC is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and appliances only. This AC does not address operational guidance for RFID tags used for record keeping, supply chain or activities.
26. AAL	9.5			Recommend changes as shown in red: To ensure passive RFID tag and system interoperability or compatibility between those components, it may be necessary to enter the RFID tag's make, model, part number, and, if included, serial number onto the product or equipment ICA or maintenance record entry (see paragraph 9.j on ICA and maintenance information). In addition, if there are particular details and requirements about how the tag is mounted, located, oriented and used where	**Not Accepted.** (See disposition to comment 12) This AC is directed to airworthiness guidance for installation of passive UHF RFID tags and devices on aircraft parts, components and appliances only. This AC does not address operational guidance for RFID tags used for record keeping, supply chain or activities at the aircraft operational level related to the aircraft configuration control, maintenance and dispatch activities centered on the RFID digital data.

				configuration control is significant, ensure those details are entered in the ICA or maintenance record entry. New aircraft being delivered with RFID tags installed need to include data about those RFID tags in the configuration data. This data should include birth record information (CAGE Code, Part Number, Serial Number, Date of Manufacture as defined in ATA Spec2000 Chapter 9-5) as well as the location of the tag in the aircraft (e.g., row, seat number). One means of delivering this data is via Spec2000 Chapter 15 Configuration Data.	
27. AAL	9.7			Recommend changes as shown in red: Qualify passive RFID tags according to SAE AS5678A, Section 6.3.5. The flammability requirements in SAE AS5678A, Section 6.3.5 apply to passive RFID tags used for part marking of critical or life-limited components (from and airworthiness perspective).	**Accepted.** Changed as follows: Qualify passive RFID tags according to SAE AS5678A, Section 6.3.5. The flammability requirements in SAE AS5678A, Section 6.3.5 apply to passive RFID tags used for part marking of critical or life-limited components.
28. AAL	9.8.1			Recommend changes as shown: Passive RFID tags used for ~~part marking of critical component or life limited parts, and components~~ the marking of airworthiness critical or life limited components must meet the following flammability requirements.	**Accepted.** Changed as follows: Passive RFID tags used for the part marking of critical or life limited components must meet the following flammability requirements.
29. AAL	9.8.2			Recommend changes as shown in red: Passive RFID tags used for ancillary part marking or tags that perform other functions must meet the flammability requirements of RTCA/DO-160, Section 26. This includes a small parts exemption for	**Not Accepted.** The intent of the guidance in paragraph 9.8.2 is to address the installation of passive UHF RFID tags and devices on parts, components and appliances only. The guidance does not deal with any specific intended utilization such as record keeping, supply chain or

				items that fit within 76.2 mm x 76.2 mm x 12.7 mm (3x3" or 9 sq. inches for a label).	similar activities. So the recommended addition 'or RFID tags that perform other functions' was not accepted. (See disposition to comments 12 and 16) The flammability requirements of RTCA/DO-160, Section 26 already includes the small parts exemption that would not contribute significantly to fire propagation, no further addition is required.
30. Honeywell	8.1.1 and subs	Federal regulations 14 CFR do NOT require that a part be permanently marked to indicate a status of "critical" or "life-limited", rather such items are required to have permanent marking with a serial number when technically feasible. ATA SPEC2000 Chapter 9-5 data, which you require via paragraph 8.3, requires the RFID data to include life-limited status.	By saying that RFID is no longer ancillary marking if the part is critical or life-limited, you have extended the reach of 14 CFR beyond what it currently authorizes in terms of what must be "marked".	Make the changes as shown in comment items #31 and #32.	**Not Accepted.** We intend to address passive RFID tags used for part marking of critical and life limited parts. These paragraphs do not intend to address passive RFID tags used to mark parts indicating status of "critical" or "life-limited".
31. Honeywell	8.1.1.1	We consider the passive RFID tags and data ancillary. ~~if they are performing a non-required, non-essential function. Passive RFID tag part marking is not considered ancillary when the aircraft, engine, or propeller components or parts are identified via RFID tag as critical or life-limited.~~	See comment item #30.		**Partially Accepted.** (See disposition to comment 30) The intent of this guidance is to address the passive RFID tags and data as ancillary if they are performing a non-required, non-essential function. The paragraph also addresses passive RFID tags used for part marking of critical and life limited parts. Clarified paragraph 8.1.1.1 as follows: 8.1.1.1 **Ancillary Part Marking.** We consider the passive RFID tags and data ancillary if they are performing a non-required, non-essential function. When using passive RFID tags for part marking of aircraft, engine, or propeller critical or life-limited components, those tags should include digital data in 14 CFR Parts 45.15(a)(2), (a)(3), (a)(4), and 45.16. (See disposition to comment 34)
32. Honeywell	8.1.1.2	~~Passive RFID part marking of critical component or life-limited parts, and~~	Delete this paragraph. See comment item #30.		**Partially Accepted.**

		~~components. When using passive RFID tags for part marking of aircraft, engine, or propeller critical or life-limited components, those tags must comply with the requirements of 14 CFR 45.15 or 45.16.~~			(See disposition to comment 30 and 31) Since there are redundant sentences between paragraphs 8.1.1.1 and 8.1.1.2, combined them into one paragraph as described in disposition to comment 31. 8.1.1.1 **Ancillary Part Marking.** We consider the passive RFID tags and data ancillary if they are performing a non-required, non-essential function. When using passive RFID tags for part marking of aircraft, engine, or propeller critical or life-limited components, those tags should include digital data in 14 CFR Parts 45.15(a)(2), (a)(3), (a)(4), and 45.16.
33. Honeywell	8.1.1.3	An integrated nameplate is an identification or part marking that … nameplate may contain the same part identification information (see 8.3~~for example, part birth record elements as defined in Airlines for America (A4A), formerly known as Air Transport Association of America, Inc. (ATA), Spec 2000 encoded in digital and printed in text formats~~). The human readable segment will act as the primary part marking and the RFID enabled segment is still considered ancillary part marking. An integrated nameplate is only interchangeable with an identical integrated nameplate.	Better to simply refer to paragraph 8.3	Change as shown.	**Not Accepted.** The digital information contained in an RFID enabled integrated nameplate should contain the same information as the human readable information and conform to an industry format.
34. Boeing	Pages: 2-3 Para: 8.1.1.1 and 8.1.1.2	The proposed text states: *"8.1.1.1* ***Ancillary Part Marking.*** *We consider the passive RFID tags and data ancillary if they are performing a non-required, non-essential function. Passive RFID tag part marking is not considered ancillary when the aircraft, engine, or propeller components or parts*	We recommend revising paragraphs 8.1.1.1 and 8.1.1.2 and combining them into one single paragraph as follows: *"**8.1.1.1 Ancillary Part Marking.*** *We consider the passive RFID tags and data ancillary if they are performing a non-required, non-essential function.* ~~*Passive RFID tag part marking is not considered ancillary when the aircraft, engine, or propeller components or parts are identified via RFID*~~	We believe there are redundant sentences between the two paragraphs. We recommend revising both paragraphs and combining them into one paragraph.	We thank you Boeing Commercial Airplanes for taking the time to review and comment on the draft AC 20-162A. **Accepted.** Changed as recommended. "8.1.1.1 **Ancillary Part Marking.**

		are identified via RFID tag as critical or life-limited. *"8.1.1.2 Passive RFID part marking of critical component or life-limited parts, and components. When using passive RFID tags for part marking of aircraft, engine, or propeller critical or life-limited components, those tags must comply with the requirements of 14 CFR 45.15 or 45.16."*	~~*tag as critical or life-limited.*~~ ~~*8.1.1.2 Passive RFID part marking of critical component or life-limited parts, and components.*~~ *When using passive RFID tags for part marking of aircraft, engine, or propeller critical or life-limited components, those tags must* ~~*comply*~~ ***include*** ~~*with*~~ *the* ~~*requirements*~~ ***digital data in items 2, 3 and 4*** *of 14 CFR* ***Parts*** *45.15* ~~*or*~~ ***and*** *45.16.* ***A part number "roll" or change is not required on parts, components and/or appliances for the installation of passive RFID tags.***"		We consider the passive RFID tags and data ancillary if they are performing a non-required, non-essential function. When using passive RFID tags for part marking of aircraft, engine, or propeller critical or life-limited components, those tags should include digital data in 14 CFR Parts 45.15(a)(2), (a)(3), (a)(4), and 45.16. A part number "roll" or change is not required on parts, components and/or appliances for the installation of passive RFID tags."
35. Boeing	Page: 3 Para: 8.1.1.3	The proposed text states: *"8.1.1.3* ***Integrated Nameplate.*** *An integrated nameplate is an identification or part marking that contains an embedded RFID chip or device that may be utilized in the same manner as other identification and markings as shown in 14 CFR 21.182 and part 45, subpart B. The exterior or human readable portion of the integrated nameplate must conform to the regulatory requirements in 14 CFR 21.182 and part 45, subpart B. The RFID enabled segment of the integrated nameplate may contain the same part identification information (for example, part birth record elements as defined in Airlines for America (A4A), formerly known as Air Transport Association of America, Inc. (ATA), Spec 2000 encoded in digital and printed in text formats). The human readable segment will act as the primary part marking and the RFID enabled segment is still considered ancillary part marking. An integrated nameplate is only interchangeable with an identical integrated nameplate."*	We recommend revising the text as follows: *"8.1.1.3* ***Integrated Nameplate.*** *An integrated nameplate is an identification or part marking that contains an embedded RFID chip or device that may be utilized in the same manner as other identification and markings as shown in 14 CFR 21.182, and part 45, subpart B. The exterior or human readable portion of the integrated nameplate must conform to the regulatory requirements in 14 CFR 21.182 and part 45, subpart B. The RFID enabled segment of the integrated nameplate* ~~*may*~~ ***must*** *contain the same part identification information (for example, part birth record elements as defined in Airlines for America (A4A), formerly known as Air Transport Association of America, Inc. (ATA), Spec 2000 encoded in digital and printed in text formats). The human readable segment will act as the primary part marking and the RFID enabled segment is still considered ancillary part marking. An integrated nameplate is only interchangeable with an identical integrated nameplate."*	We believe this will clarify the expectation better.	**Not Accepted.** FAA Order 1320.46D Chapter 3 paragraph 7.f states: "f. Use "must" to convey regulatory requirements." Use of "must" as recommended is not warranted since the commented provision is not a regulatory requirement.

36. Boeing	Page: 3 Para: 8.2.	The proposed text states: *"8.2* ***Passive RFID Tags.*** *Passive RFID tags must meet the requirements of SAE AS5678A. Passive RFID tags used for ancillary part marking don't have to meet the requirements of paragraph 6.4, Data Retention Life Expectancy, in AS5678A."*	We recommend removal of the second sentence and revising the text as follows: *"8.2* ***Passive RFID Tags.*** *Passive RFID tags must meet the requirements of SAE AS5678A.* ~~*Passive RFID tags used for ancillary part marking don't have to meet the requirements of paragraph 6.4, Data Retention Life Expectancy, in AS5678A.*~~ ***The use of passive UHF RFID tags and devices is considered ancillary part marking and does not replace the original part marking as shown in 14 CFR Parts 45.15 and 45.16. Therefore, the life expectancy of the RFID tag and/or device should meet the life requirements as shown in SAE AS5678A."***	We believe the life expectancy of the RFID tag and/or device should meet the life requirements as shown in SAE AS5678A.	**Accepted.** Changed as recommended.
37. Boeing	Page: 3 Para: 8.3	The proposed text states: *8.3* ***Passive RFID Tags Data.*** *Passive RFID tags data must meet A4A Spec 2000, chapter 9-5, revision 2013.1."*	We recommend revising the text as follows: *"8.3* ***Passive RFID Tags Data.*** *Passive RFID tags data must meet A4A* ***(former ATA)*** *Spec 2000, chapter 9-5, revision* ~~*2013.1*~~***2015.1****."*	Incorrect document reference.	**Accepted.** (See disposition to comment 5)
38. Boeing	Page: 5 Para: 9.8	The proposed text states: *"9.8* ***Flammability And Fire Safety.*** *The adhesive or means of attachment of the passive RFID tags must be included in the flammability testing as part of meeting the flammability requirements.* *9.8.1 Passive RFID tags used for part marking of critical component or life-limited parts, and components must meet the following flammability requirements.* *9.8.1.1 All tags with a longest dimension greater than 50 mm must comply pursuant to the flammability requirements specified in SAE AS 5678A, Table 3 and 14 CFR 25.853(a), and Appendix F part 1 paragraph (a)(1)(ii).*	We recommend deleting the section 9.8 entirely.	The RFID tags are small parts that do not contribute significantly to the propagation of fire. They are exempted under the "small parts clause" of appendix F of 14 CFR 25.853 which reads: *(v) Except for small parts (such as knobs, handles, rollers, fasteners, clips, grommets, rub strips, pulleys, and small electrical parts) that would not contribute significantly to the propagation of a fire and for electrical wire and cable insulation, materials in items not specified in paragraphs (a)(1)(i), (ii), (iii), or (iv) of part I of this appendix may not have a burn rate greater than 4.0 inches per minute when tested horizontally in accordance with the applicable portions of this appendix.*	**Not Accepted.** The complete passive RFID tag (including adhesive materials) must meet appropriate flammability requirements since the tag and adhesive materials with a longest dimension greater than 50 mm is not small part, and flammability concerns due to the high number of multiple tags used on aircraft, including those in the pressurized compartment. Kept the flammability criteria and guidance in paragraph 9.8 in this draft AC since: • The flammability criteria of RTCA/DO-160, Section 26 in paragraph 9.8.2 of the draft AC for passive RFID tags used for ancillary part marking provide the exemption under the

		9.8.1.2 All tags with a longest dimension less than 50 mm must comply pursuant to the requirements specified SAE 5678A, Table 3 and 14 CFR 25.853(a) and Appendix F part 1 paragraph (a)(1)(v). *9.8.2 Passive RFID tags used for ancillary part marking must meet the flammability requirements of RTCA/DO-160, Section 26."*			"small parts clause" of appendix F of 14 CFR 25.853 for small parts, where the greatest dimension is less than 50 mm that would not contribute significantly to fire propagation. • The flammability criteria and guidance in paragraph 9.8 of the AC are consistent with those used EASA and IATA. • The airlines (users) and suppliers have agreed with these flammability criteria and guidance. • These criteria and guidance are less stringent than the flammability criteria described in the industry standards SAE AS5678A.
39. Boeing	Page: 5 Para: 9.9	The proposed text states: *"9.9* ***Mounting And Attachment Integrity.*** *The installed passive RFID tag must be permanently affixed to aircraft parts using approved adhesives, methods and processes. Describe the mounting or attachment method you use in the certification plan to show compliance with the 14 CFR requirements referenced in this paragraph. Installers of passive RFID tags must comply with 14 CFR 23/25/27/29.301, .303, .305, .307, .471, .561, .601, 23.333, or 25.333 by design data review, analysis or test. You may demonstrate compliance with 14 CFR 23.787, 25.787, 25.789, 27.787, or 29.787 by design data review or analysis."*	We recommend deleting the second, third and fourth sentences from this paragraph altogether as follows: *"9.9* ***Mounting And Attachment Integrity.*** *The installed passive RFID tag must be permanently affixed to aircraft parts using approved adhesives, methods and processes.* ~~*Describe and document the mounting or attachment method you use in the certification plan to show compliance with the 14 CFR requirements referenced in this paragraph. Installers of passive RFID tags must comply with 14 CFR 23/25/27/29.301, .303, .305, .307, .471, .561, .601, 23.333, or 25.333 by design data review, analysis or test. You may demonstrate compliance with 14 CFR 23.787, 25.787, 25.789, 27.787, or 29.787 by design data review or analysis*~~*."*	The installation of UHF passive RFID may be considered a Minor change. Any engineering assessment, drawing, engineering orders and approvals that address 14 CFR Part 25.1301 or 25.1309 should be satisfactory for the approval of a Minor change.	**Partially Accepted.** Agreed that the installation of UHF passive RFID may be considered a Minor change. Need to describe the mounting or attachment method in the certification plan. (See disposition to comments 54 and 55)
40. Airbus	Page 4 / § 8.1.2	This section addresses other functions than section 8.1.1. This should be clearly mentioned in a title.	This section describes an action for passive RFID tags when they fulfil other than a part marking function.	Add a title to this section: "8.1.2 Other functions"	We thank you Airbus for taking the time to review and comment on the draft AC 20-162A.

					Accepted. Changed as recommended.
41. Airbus	Page 4 / § 8.1.2	The mentioning of the full system safety assessment requirements and the SAE ARP 4761 is misleading.	The failure conditions of the passive RFID tags are required not to be worse than minor.	This section should read: "Assess the Equipment, systems and installation safety pursuant to 14 CFR 23.1309(a)(2), 25.1309(a)(2), 25.1309(a)(2), 27.1309(a)(2), 29.1309(a)(2), 33.28, 33.75 and/or 36.23	**Accepted.** Agreed that the installation of passive RFID is considered a "minor effect". Paragraph 9.2 states: ….. Your safety analysis of the design and installation of passive RFID tags should demonstrate that normal operation, failures, or malfunctions will not have greater adverse impact than "minor effect" …..
42. Airbus	Page 4 / § 9.2	The first sentence of this paragraph mentions "Assess the installed passive RFID tag safety pursuant to 14 CFR 25.1309…" This sentence is misleading with regards to the safety assessment to be done.	As explained in §8.1.2 adverse effects of the tag installation and function should be addressed in the safety assessment. FAR 25.1309 is about safety of Equipment, systems and installation of the aircraft.	This sentence should rather read " Assess the Equipment, systems and installation safety pursuant to 14 CFR 23.1309….considering the potential adverse effects of installed passive RFID tag".	**Accepted.** Changed as recommended.
43. Airbus	Page 4 / § 9.2	Several references are given to Advisory circulars that are obsolete.	E.g. AC 25-1309-1 is cancelled and has been replaced with AC 25.1309-1A	Correct the references listed in the paragraph or mention that the latest issues of the mentioned advisory circulars have to be considered.	**Accepted.** Corrected as recommended.
44. Airbus	Page 4 / § 9.4	Installation of a passive RFID tag is considered as an alteration the classification (major or minor) of which depends on the criteria of paragraph (a) of Appendix A to part 43. However, appendix A to part 43 lists more or less all structure / system / engine parts. It is understood that a tag installed on any of those parts would trigger a major classification of the alteration.	From an airplane manufacturer point of view, this is seen as a high administrative burden with a potential significant cost vs benefit. Furthermore, non-mechanical installation of a tag shall not affect the existing approval of the parts or component.	Change the alteration classification text so that RFID tags installation can be classified as MINOR unless the tag installation affects the existing approval of the part or component in a way that complementary compliance data is required.	**Accepted.** Changed paragraph 9.4 to: The installation of passive RFID tags under an alteration is considered a minor alteration unless the tags installation meets the requirements in paragraph (a) of Appendix A to part 43. .
45. Airbus	Page 5 / § 9.8	14CFR 25.853(a) should only apply to RFID tags installed in compartment interiors occupied by crew or passengers. Small parts criteria as prescribed in	25.853(a) only applies to materials in compartment interiors occupied by crew	Indicate that §9.8 only applies to RFID tags installed in pressurized area of the fuselage	**Partially Accepted.** The flammability criteria in paragraph 9.8.2 of the draft AC for passive RFID tags used for ancillary part

		Appendix F part I should also be considered.			marking provide the exemption under the "small parts clause" of appendix F of 14 CFR 25.853 for small parts, where the greatest dimension is less than 50 mm that would not contribute significantly to fire propagation. (See disposition to comment 8) We have determined that the flammability criteria in the regulation of 14 CFR 25.853 and Appendix F, Part 1 also apply to RFID tag applications outside the aircraft compartment interior due to the following reasons: 14 CFR 25.865, *Fire protection of flight controls, engine mounts, and other flight structure*, and 25.869 (a)(2), *Fire protection: systems*, govern flammability requirements for parts/materials of equipment and systems in the aircraft located outside the compartment interior. These requirements do not address specific flammability criteria. To comply with the regulatory requirements of 14 CFR Part 21.21(b)(1) that reads: "…. any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety", flammability criteria must be available for parts/materials of aircraft equipment and systems located outside the compartment interior. We have determined that 14 CFR 25.853 and Appendix F, Part 1 provide acceptable flammability criteria for parts/materials of aircraft equipment and systems exterior to the compartment interior. <u>Action:</u> Added the following note after paragraph 9.8.1.2 in the draft AC: "**Note:** 14 CFR 25.865, *Fire protection of flight controls, engine mounts, and other flight structure*, and 25.869 (a)(2), *Fire protection: systems*, govern flammability requirements for parts/materials of equipment and systems in the aircraft located outside the compartment interior. These requirements do not

					address specific flammability criteria. To comply with the regulatory requirements of 14 CFR Part 21.21(b)(1) that reads: "…. any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety", the FAA has determined that 14 CFR 25.853 and Appendix F, Part 1 provide acceptable flammability criteria for parts/materials of aircraft equipment and systems exterior to the compartment interior."
46. Airbus	Page 5 § 9.8	Same requirements as for labels or placards should be applied to RFIDs tags that consist of adhesive tape with some copper traces and a small and flat ID tag (15 s HBB App F part I(a)(v)).	These tags are very similar to placards, including adhesive.	Propose same flammability requirements as for labels/placards installed in the pressurized area of the fuselage.	**Partially Accepted.** FAA Policy Statement PS-ANM-25.853-01, dated August 16, 2012 addresses new flammability requirements for placards. The flammability criteria described in the draft AC for the complete passive RFID tag (longest dimension greater than 50 mm, small part exemption) in the pressurized area of the fuselage are consistent with those in the FAA Policy Statement PS-ANM-25.853-01. Furthermore, flammability concerns due to the high number of multiple tags installed in the pressurized area of the fuselage should be taken into consideration.
47. Airbus	Page 5 / § 9.9	It is stated in this paragraph that Installers of passive RFID tags must comply with 14 CFR 23/25/27/29.301, .303, .305, .307, .471, .561, .601, 23.333, or 25.333 by design data review, analysis or test. Most of the paragraphs mentioned are not relevant and should be removed.	FAR 25.301 is covering loads definition at airplane level. There is no reason for this paragraph to be impacted due to the tag installation.	Remove compliance with 25.301.	**Accepted.** Removed as recommended.
48. Airbus			FAR 25.303 defines the factor of safety to apply. There is no reason for this paragraph to be impacted due to the tag installation.	Remove compliance with 25.303.	**Accepted.** Removed as recommended.
49. Airbus			FAR 25.305 and 25.307 are usually not affected in case of bonding of the tag onto the part/component. 25.305 may be affected in case of mechanical installation (e.g. riveting, bolting, welding)	Specify that "installation of passive RFID tags have to comply with 25.305 when relevant".	**Accepted.** Changed as recommended.
50. Airbus			FAR 25.471 covers limit ground loads and equilibrium, critical centers of gravity and landing gear dimension data. There is no reason for these	Remove compliance with 25.471.	**Accepted.** Removed as recommended.

			paragraph/subparagraphs to be impacted due to the tag installation.		
51. Airbus			FAR 25.561(a)(b) cover protection of occupants in a minor crash landing. However, models used for such compliance demonstration usually remain at airplane / fuselage section level and do not go down to the detail of the installation of tags. FAR 25.561(c)(d) cover seats and retention of items of mass. Tags generally weigh less than 10g and therefore cannot alter the existing compliance demonstration for seats or items of mass. Potential mechanical installation of passive RFID tags potentially affecting retention capability of seats or item of mass is addressed under 25.305.(see comment 6)	Remove compliance with 25.561.	**Accepted.** Removed as recommended.
52. Airbus			FAR 25.601 "design features or details that experience has shown to be hazardous or unreliable", but tag installation is simple and state of the art.	Remove compliance with 25.601.	**Accepted.** Removed as recommended.
53. Airbus			FAR 25.333 covers Flight maneuvering envelope. Since this envelop is defined at airplane level, there is no reason for this paragraph to be impacted due to the tag installation.	Remove compliance with 25.333.	**Accepted.** Removed as recommended.
54. Airbus			Add §25.605 to ensure no adverse effect from the RFID tag bonding on the structure and durability of the fixation of the tag through use of validated material, method and processes.	Add compliance demonstration with 25.605.	**Accepted.** Changed the third and fourth sentences of § 9.9 as followed. Installers of passive RFID tags must comply with 14 CFR 23/25/27/29.605, 23.787, 25.787(a),(b) and 25.789, 27.787(a),(b),(c), or 29.787(a),(b),(c) by design data review, analysis or test.
55. Airbus	Page 5 / §9.9	This paragraphs states "You may demonstrate compliance with 14 CFR 23.787, 25.787, 25.789, 27.787, or 29.787 by design data review or analysis".	FAR 25.787(a)(b) and 25.789 cover stowage compartment and retention of items of mass in case of emergency landing. Compliance demonstration with these paragraphs should	Remove compliance with 25.787(c). Specify that "installation of passive RFID tags have to comply with 25.787(a),(b) and 25.789 in case of mechanical installation affecting retention	**Accepted.** (See disposition to comment 54)

		However, 25.787 and 25.789 are not entirely relevant to passive RFID tags.	not be impacted by tags installation except in case mechanical installation (riveting, bolting). FAR 25.787(c) is about cargo compartment lights and is not impacted by the installation of tags.	capability of stowage compartment or item of mass"(also see comment 45).	

Attachment Referenced in Comment 2 on Paragraph 1

Table 1 Definition of Terms

Terminology	Meaning	Functional Impact
Must	Indicates a mandatory requirement driven by regulation that is to be followed when using the guidance in this AC	Alternative means of compliance has to be accepted by the FAA
Should	Indicates a recommendation and not a requirement when using the guidance in this AC	None, because it is optional