

Master Comment Log
AC 20-XXX ASNRT

#	Commenter	Page & Para. No.	Comment	Reason for Comment	Suggested Change	Comment Resolution
1.	B. Higuichi ANM-100L	Page 1 / Para 1	ANM-130L is unable to determine what Airborne Systems for Non Required Telecommunications (ASNRT) service equipment is.	A more detailed description of ASNRT or maybe specific examples is recommended.	Revise the paragraph.	Partially Concur – Paragraph 1 contains a high level description and as such we determined that an example would best fit within the scope section found in paragraph 3. Added an example to paragraph 3
2.	T. Ebina ANM-100L	Page 2 / Para 4a	The second sentence regarding the safety assessment should be rewritten for clarification. It states, “The safety assessment should determine, classify and evaluate failure conditions resulting from malfunction, loss of function, or design errors.”	The assessment should also consider crew, performance, external factors, etc, for consideration completeness of the failure conditions classifications. Further, the term “design errors” is addressed in this section but the rest of the draft AC did not address it.	Revise the paragraph.	Partially Concur – While we agree that crew performance and external factors need to be considered we felt that this AC is not the guiding document on performing a safety assessment. What we do is point out that one is required and to refer to SAE ARP 4761 for safety assessment guidance.
3.	T. Ebina ANM-100L	Page 3 / Para 4b	The last sentence may be incomplete. It states: “Based upon	This paragraph should include a loss of	Revise the paragraph.	Concur – Functional loss or

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			the above assumptions, the likelihood of failure or malfunctions of ANSRT equipment should be shown to be no more likely than probably.”	function, too. The loss of the ANSRT function resulting from the loss of an external electrical power source is different from the internal ANSRT failure or malfunctions.		malfunction is included in the third sentence in paragraph 4b.
4.	Deane Thomson ANM-100S	P3, sect 4(c)	Greater than minor implies some impact on the aircraft operation is allowed.	The rest of the document defines interface but no operational impact to plane or crew.	Should be Minor or greater.	Partially concur – In 4.b we explain the loss or malfunction should be limited to a minor increase in crew work load which is commensurate to a minor hazard classification. We added wording to 4.c indicating anything greater than minor is out of scope of this AC.
5.	Raymont Mei ANM-100S	P3, Sect 5	There is no hardware design requirement.	All airborne electronics should meet DO standards.	Adding Hardware subsection that requires meeting: (1) DO254 – Design Assurance	Partially concur – Refer to paragraph 4.c where we state that if your safety assessment determines a

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					<p align="center">Guidance for Airborne Electronic Hardware (2) DO160G - Environmental Conditions and Test Procedures for Airborne Equipment</p>	<p>hazard classification greater than minor than your equipment is outside the scope of this AC and to contact your ACO. DO-254 is an optional requirement for hardware determined to be a minor or lower hazard classification. This AC does not prevent the use of DO-254 and if we include it than it will be a requirement by default. We have added additional testing per DO-160G in paragraphs 6, 9 & 10.</p>
6.	Joe Collier ANM-100S	P 3, sect 5	Does not address Airborne Electronic Hardware concerns.	Many electronics contain custom ASIC, FPGA, PLD.	AEH should comply with AC 20-152, DO-254.	Partially concur – Same as comment 5 above. See above response.

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7.	T. Ebina ANM-100L	Page 3 / Para 5a	This paragraph states that the ASNRT equipment should comply with RTCA/DO-178B without similar compliance with RTCA/DO-254.	In addition to the voluntary compliance of software with DO-178B, the ASNRT should comply with DO-254 for its airborne electronic hardware (if any).	Revise the paragraph.	Partially concur – Same as comment 5 above. See above response.
8.	Joe Collier ANM-100S	P 3, sect 5c	Does not address network security concerns.	May use public internet as a medium for communication and may use digital information packets for voice or data.	Connecting the internet to aircraft control systems or aircraft sensors (fig 1) will invoke a special condition on the aircraft.	Concur – revised paragraph 5.c See comments 9 and 10 which are applicable to this comment.
9.	Siegmund & Khaouly, ANM-111	P3. Para c(1)	“ASNRT equipment should not impair the airworthiness of the aircraft when operating under normal conditions, or if ASNRT encounters failure...”	When it has failed and when it has not-failed. Complicated sentence structure.	Simplify to: “ASNRT equipment should not impair the airworthiness of the aircraft <u>under any foreseeable operating conditions.</u> ”	Concur – Revised as suggested
10.	Siegmund & Khaouly, ANM-111	P3. Para c(2)	Clause is correct but can easily be clearer.	Generated a lot of questions from specialists here.	“The ASNRT equipment must not interfere with other on-board systems <u>in any manner, under any foreseeable operating conditions.</u> ”	Concur – Revised as suggested
11.	Siegmund & Khaouly,	P3. Para c(4) <i>Note</i>	“...it is assumed that...” is ambiguous.	Should be stronger. It looks like the intent is	Say so here, or declare all	Concur – Revised the note by

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	ANM-111			to imply or make no alteration to rules and guidance about cockpit voice recording.	assumptions about audio recording out of scope in Section 3.	removing “it is assumed that”
12.	Raymont Mei ANM-100S	P3, Sect 5 (d)	There is wiring requirement spelled out.	EWIS is required for electrical equipment.	AC 25-27A is recommended for meeting the EWIS requirement.	Non concur – EWIS requirements need to be addressed when developing the instructions for continued airworthiness. AC 25-27A is for large transport category aircraft and provides a method of complying with SFAR 88 requirements for electrical wiring zonal inspections. We felt that it is out of scope for this AC
13.	T. Ebina ANM-100L	Page 3 / Para 5d	This paragraph should clearly state that the use of the switch position for the ASNRT activation status is not recommended: Turned OFF or Turned ON.	The position of the ASNRT switch must not be used as a means to indicate it is turned OFF or ON for safety assurance of the ASNRT activation.	Revise the paragraph.	Non Concur – The term “switch” is not found in paragraph 5.d
14.	T. Ebina ANM-100L	Page 4 / Para 5e(1)	This paragraph may require clarification. It states, “Flight crew operation of the ASNRT equipment	The phrase “detrimental to continued safe aircraft	Therefore, we should use the phrase “not significantly reduce	Partially concur – Revised paragraph 4 for the safety

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			should not significant affect workload or be detrimental to continued safe aircraft operation.”	operation” may not necessarily equate to “not significant workload impact.”	airplane safety margins,” rather than the phrase “detrimental to continued safe aircraft operation.”	assessment where this type of information belongs. Revised this paragraph to remove “or be detrimental to continued safe aircraft operation” and revised text to address crew work load.
15.	Siegmund & Khaouly, ANM-111	P4. Para e(2) <i>Note</i>	Human Factors considerations AC20-138B are functionally accurate but the document itself is not on point to this topic of ASNRT.	There is a more-relevant AC nearly finished, should be released before this one. Contact Cathy Swider, AIR-120 for details.	Refer to AC20- <i>CNTL</i> , “Controls for Flight Deck Systems.” It is directly on point for this and all other controls. Its number and release date will be ready for use.	Partially concur – We intend to reference the new guidance if published prior to this AC. If not, we cannot reference an unpublished AC
16.	Raymont Mei ANM-100S	P4, Sect 6	No specific EMI test listed.	DO160 standard is recommended.	Refer to DO160G.	Concur – Revised paragraph
17.	T. Ebina ANM-100L	Page 4 / Para 6	This paragraph does not address the test location of the Electromagnetic Compatibility test.	The AC should indicate whether or not the Electromagnetic Compatibility test can be conducted on the ground, flight, or both.	Revise the paragraph.	Partially concur – Revised paragraphs 9.a and b. to include specific ground and flight test requirements for

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						electromagnetic compatibility
18.	T. Ebina ANM-100L	Page 4 / Para 7	This paragraph requires the Lightning Protection.	The Lightning Protection test should be a voluntary compliance item, rather than the requirement.	Revise the paragraph.	Non concur – The lightning protection is required for an external antenna installation only and is so stated
19.	T. Ebina ANM-100L	Page 5 / Para 9a(5)	This paragraph addresses DO-160 versions D, E and F.	The current RTCA Environmental Qualification Test is DO-160G.	The AC should reference the latest version.	Concur – Revised as suggested where applicable. Paragraph numbering has changed due to other comments
20.	Siegmund & Khaouly, ANM-111	P6. Para 11	Related Guidance Documents are subject to revision and (ref. Human Factors) future releases.		Add “or later revision,” especially regarding AC20-140A, soon to be B Also add AC2-CNTL (Draft)	Partially concur – Added suggested text to FAA published documents. We will add AC 20-CNTL if published prior to this AC
21.	P. Sheridan 106B	Page 6	Related Guidance Documents. L, M are not easy to find in RGL. Should either be fixed in RGL or link given to be able to find in RGL.	Hard to find supporting documents.	Change RGL to match. i.e. AC 27-1B, break it apart and give AC 27.1551 it’s own line not imbedded.	Partially concur – Added the location information
22.	Dave Walen	p. 4 para 6	Use the words electromagnetic compatibility, not non-interference. Use the term ‘adverse effects’. Be more specific about tests with	Use terms that are consistent with regulatory text, such as text in 25.1431(c).	6. Electromagnetic Compatibility. Electromagnetic compatibility tests	Concur – Revised as suggested

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			portable antenna designs, such as Iridium handsets with integrated antennas.	Clarify the intent for antenna installations and portable antennas.	should be performed to demonstrate that the ASNRT does not adversely affect other aircraft systems, including other required radio systems. The electromagnetic compatibility tests should be performed with the ASNRT antennas installed. If the ASNRT uses handsets with integrated portable antennas, the electromagnetic compatibility tests should be performed with the handsets and integrated portable antennas operated in all aircraft locations where the handset is expected to be used. RF emissions tests on the ANSRT equipment using RTCA/DO-160 section 21 or equivalent standards are highly	

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					encouraged.	
23.	Dave Walen	p. 5 section 9.a	Paragraphs 4 and 5 do not clearly explain the approach for aircraft electromagnetic compatibility ground tests.	Paragraphs 4 and 5 do not clearly explain the approach for aircraft electromagnetic compatibility tests.	Proposed text with revision marks is in separate file.	Concur – Revised as suggested
24.	Dave Walen	p. 5 section 9.b	This paragraph does not clearly explain the approach for aircraft electromagnetic compatibility flight tests.	This paragraph does not clearly explain the approach for aircraft electromagnetic compatibility flight tests.	Proposed text with revision marks is in separate file.	Concur – Revised as suggested
25.	Dave Walen	p. 6 section 11.h	DO-160 and AC 21-16 are both now at revision G		h. AC 21-16G, RTCA Document DO-160 versions D, E, F, and G, “Environmental Conditions and Test Procedures for Airborne Equipment.”	Concur – Revised as suggested
26.	AIR 500	Paragraph 1a, 1 st sentence, Page 1	Change wording.		Rewrite to read: In this advisory circular (AC), the Federal Aviation Administration (FAA) recommends one way...	Concur – Revised as suggested
27.	AIR 500	Paragraph 1d, last sentence, Page 1	Improper capitalization.		Remove the capitalize from the term “equipment”.	Concur – Revised as suggested
28.	AIR 500	Paragraph 1d, Bullet Section, Page 1	Remove bullets.	Bullets can be difficult to reference.	Replace with a number for referencing	Concur – Revised as suggested

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					purposes.	
29.	AIR 500	Paragraph 3, 1 st sentence, Page 2	Missing comma.		Place a comma after the number 27.	Concur – Revised as suggested
30.	AIR 500	Paragraph 3, last sentence, Page 2	The term “system wide information management” has already been defined.		Use the acronym “SWIM”.	Concur – Revised as suggested
31.	AIR 500	Figure 1, Middle Box to the left, Page 2	Typo.		The term “Unit” is cut off in the box. Adjust the figure so all the wording can fit in the appropriate box.	Concur – Revised as suggested
32.	AIR 500	Paragraph 4c, Page 3	Define the term “aircraft certification office” first.		Use the acronym “ACO” after the first usage of the term.	Concur – Revised as suggested
33.	AIR 500	Paragraph 9a(2), Page 5	Improper usage of the conjunction “and”.	Delete the term “and” found after the word “features”.	Replace with a comma.	Concur – Revised as suggested
34.	AIR 500	Paragraph 9a(4), 2 nd and 3 rd sentence, Page 5	Define the term for the acronym “SATCOM”.		Use the acronym “SATCOM” after the first usage.	Concur – Revised as suggested Note – This paragraph moved to 9a(5)(e)
35.	AIR 500	Paragraph 9b(2), Page 5	Improper usage of verb.	Delete the term “is” found after the word “system”.	Replace with the term “are”.	Concur – Revised as suggested
36.	AIR 500	Paragraph 10, Page 5	Missing period. Incorrect format.		Place a period after the term “Supplement” found in parenthesis at the end of the paragraph title. Move paragraph 10	Concur – Revised as suggested

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					to next page with related information.	
37.	AIR 500	Paragraph 10a, Page 6	The terms “airplane flight manual” and “rotorcraft flight manual” have already been defined.		Use the acronyms “AFM” and “RFM”.	Concur – Revised as suggested
38.	AIR 500	Paragraph 11k, Page 6	Missing period.	Inconsistent with the rest of the document.	Place a period after the term “Manual”.	Concur – Revised as suggested
39.	AIR 500	Signature Block, Page 7	Suggestion.		Check the spacing between the last paragraph and signature block. There should be only five spaces between the last paragraph and signature block.	Concur – Revised as suggested
40.	Hilton	Page 1, paragraph 1d.	Consider removing references to advisory material for installations that are out of scope of this AC	The first sentence, of paragraph 1d is sufficient in explaining the scope.	Change paragraph 1d to read “Voice and data communication systems that support operationally required communications are out of scope for this AC.	Concur – Removed guidance material for required ATS communication systems
41.	ACE-117C, W. Jaconetti	Page 1, Para 1.d.	Paragraph 1.d. includes a good bit of reference information for something that is not in scope for this AC. It seems out of place.	A lot of text to cover information that is not in scope.	Make a more brief reference to the other information that is not in scope for this AC.	Partially concur – same as comment 40 above, see response to item 40.
42.	ACE-117C, W. Jaconetti	Page 2, Para 3.	The acronym ASNRT at the beginning of the 2 nd sentence is misspelled as ANSRT.	Misspelling	Change to ASNRT	Concur – Revised as suggested
43.	ACE-117C, W. Jaconetti	Page 2-4, Para 4.0-10.0	Multiple references are made to safety analysis and design	Could be helpful to applicants to have the	Include appropriate regulation references	Partially concur – While parts of this

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			considerations that are derived from 14 CFR (parts 23, 25, 27 & 29), but the relevant 14 CFR sections are not referenced alongside the requirement.	appropriate regulatory references included in the AC, so there is a correlation when it comes to their compliance checklist	(example: 2x.1309 for safety assessment, 2x.1353 for electrical equipment compatibility, 2x.1357 for circuit protective devices, etc)	AC do address requirements of 2x.1309, 2x.1353 and others it is not inclusive of the entire section of the regulation dependant on the type of installation. Therefore we decided to not include each 14 CFR requirement.
44.	ACE-117C, W. Jaconetti	Page 3, Para 4.b.	Wording in the last 2 sentences, with respect to design assurance level & intended function, is somewhat cumbersome.	Clarity of guidance	Suggest rewording to delineate that based on the intended function of the ASNRT installation, it should be shown that a failure of the system results in an effect on crew workload of no more greater than minor. Then note that the system would have to be developed to the appropriate design assurance level to correspond to minor or below.	Partially concur – See response to items 2, 3, and 4 above.
45.	Hilton	Page 3 paragraph 4c	Consider the addition of some wording to indicate these types of installations are on a non-			Acknowledged – We feel this concern is defined

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			interference basis and considered non-required, non essential equipment.			in the scope found in paragraph 1. No further change to 4.c
46.	Atlanta ACO – ACE-119A Mitch Huffman	Page 3, Paragraph 5b	47 CFR 22.925 indicates cellular telephones must not be operated while airborne rather than a particular maximum altitude at which certain equipment may be operated. The reference should not imply that a maximum altitude exists.	Eliminate Confusion	Change to read – The FCC restricts the airborne use of cellular telephones in 47 CFR 22.925 or remove the reference.	Concur – revised as suggested
47.	Atlanta ACO – ACE-119A Mitch Huffman	Page 3, Paragraph 5b	There seems to be some confusion about the scope of FCC regulations as it relates to the frequency of the phones.	Eliminate Subjectivity	Please specify the non aeronautical frequencies this AC applies to. If it applies to all, then specify that it applies to all, including cellular telephones.	Partially concur – We have revised the text of 5b (see item 46 above), however, we are not including a list of non aeronautical spectrum
48.	Hilton	Page 3, paragraph 5d.	Consider the addition of some wording to install this equipment on non-essential electrical busses.			Partially concur – While this will really depend on the type certification and electrical generating system capabilities we did add text to utilize a non essential bus or load shedding capabilities if applicable
49.	Flores	Page 3,	Airborne Electronic Hardware	The AC addresses	Add reference to AC	Partially concur –

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		paragraph 5a.	(AEH) design assurance should also be considered.	software; AEH should also be considered	20-152 and RTCA DO-254.	see items 5, 6, & 7 above
50.	ACE-117C, W. Jaconetti	Page 5, Para 9.a.(5)(a)	During the tests for compatibility and spurious emissions, it is noted in (a) that the ASNRT equipment should be powered, but should we also state that it be transmitting? I'm not sure how each of these work, but with some comm. Systems it isn't enough to be powered, there also has to be a signal.	To ensure that the proper emissions are being delivered from the system under test	Word the paragraph so as to say that the ASNRT system needs to be powered and transmitting (if applicable)	Concur – Paragraph 9 was revised. See related item 23 which incorporated language provided by EMI CSTA
51.	Mark Wiley	Pg 6 Para l	Item l. references a particular section from mega-AC: AC 27-1B	Clarity	Change reference to AC 27-1B	Partially concur – Added clarification that AC 27.1351 is found in AC 27-1B
52.	Mark Wiley	Pg 6 Para m.	Item m. references a particular section of mega AC: AC 29-2C	Clarity	Change reference to AC 29-2C	Partially concur – Added clarification that AC 29.1351 is found in AC 29-2C
53.	Mark Wiley	Pg 3 Para 5.b	Aviation radios must comply with FCC regulations 47 CFR Part 87	Completeness	Add requirement reference to Part 87	Concur – revised to include 47 CFR Part 87
54.	Mike Heusser ASW-150	Page 3 section 5.b	States: “The FCC restricts the maximum altitude at which certain equipment may be operated”	47 CFR 22.925 is silent on altitude and indicates that cellular phones may only be operated while on the ground.	Please explain/resolve FCC – 47 CFR 22.925 disparity as it relates to this AC	Concur – Revised. Utilized the wording found in 22.925
55.	Mike Heusser ASW-150	Page 1 Section 1	“Purpose” should include information regarding Noninterference STCs.	Clarification	Please reference FAA Order 8110.4C page 93 for a discussion of non-interference STC.	Non concur – The order is for FAA employees and/or designees. This AC is for

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						equipment manufacturers and installers
56.	ASW-170	Page 5 Paragraph 9.a.(5)	Clarify that DO-160 testing is not an acceptable alternative to performing an aircraft level electromagnetic compatibility (EMC) test.	DO-160 data will inform the decision of test points contained in the aircraft level EMC test procedure. An aircraft level test is mandatory	Add to sentence, “an acceptable means of satisfying this objective is in AC 21-16F...”Emission of Radio Frequency Energy,” In addition to installed electromagnetic compatibility tests.	Partially concur – Paragraph 9 was revised. See related items 23 & 50 which incorporated language provided by EMI CSTA