

## Comments for Draft Revisions AC 20-150B SATVOICE (Consolidated Public Comments)

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**Comments Submitted By:** David Robinson

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#	Document Name	Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution	Comment Type (Conceptual, Editorial, or Format)	Disposition/Response to Comment
1	Garmin	4	8.3	<p>“There should be a continuous visual annunciation to the crew indicating a call in progress for each satellite voice channel available via the flight deck audio panel...”</p>	<p>Request clarification of “continuous visual indication” in these instances with respect to Integrated Flight Deck systems that may not have discrete audio panels.</p> <p>For example: Would a crew advisory system message that persists for the duration of the call status be consistent with the intent of these requirements?</p>	<p>Reword to accommodate the use of indicating capabilities or displays other than an audio panel to indicate the call progress and connection status.</p>	Conceptual	<p>Concur, changed text to indicate that the flight deck audio panel is one acceptable place to provide this annunciation. The intent is to provide feedback to the flightcrew that the SATVOICE system is in use.</p>
					<p>Recommend separating this into 2 scenarios:</p> <ol style="list-style-type: none"> <li>1) The event where satellite signal is lost but there is not an active call.</li> <li>2) The event where satellite signal is lost and there is an active call.</li> </ol>	<p>Reword as follows:</p> <p>8.7a In the event of satellite signal loss, when there is no active call, the satellite voice system should provide a visual indication to the flightcrew.</p>		

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2	Garmin	5	8.7	<p>“In the event of satellite signal loss, the satellite voice system should alert the flightcrew.”</p>	<p>When in scenario 1, a visual indication to the flight crew may be adequate in lieu of an alert. It is known in industry that SATCOM signals can be lost, from time to time, due to inherent characteristics of the Satellite networks. Requiring an alert every time a SATCOM signal is lost could become an annoyance to the flight crew.</p> <p>When in scenario 2, it would be appropriate for an alert to be required in order to provide feedback to the flight crew that the satellite signal had been lost while a call was active.</p>	<p>8.7b In the event of satellite signal loss, when there is an active call, the satellite voice system should alert the flightcrew.</p>	Conceptual	<p>Nonconcur, this requirement is consistent with ICAO GOLD and SVCM. No change required.</p>
3	Garmin	5	8.9	<p>“The system should provide a continuous visual indication that a satellite communication (SATCOM) call is connected, ... of the flightcrew member”</p>	<p>Request clarification of “continuous visual indication” in these instances with respect to Integrated Flight Deck systems that may not have discrete audio panels.</p>	<p>Reword to accommodate the use of indicating capabilities or displays other than an audio panel to indicate the call</p>	Conceptual	<p>Comment acknowledged no change. The intent is to provide feedback to the flightcrew that the SATVOICE system is in use.</p>

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				even if the flightcrew member is talking on another radio system.”	For example: Would a crew advisory system message that persists for the duration of the call status be consistent with the intent of these requirements?	progress and connection status.		The text does not specify what equipment this indication must be provided on.
4	Garmin	5	8.11	“The system should provide an aural indication of satellite voice connection.”	While it is likely that this means an aural indication should be provided upon connection of a satellite voice, the wording is somewhat ambiguous.	Reword as follows:  The system should provide an aural indication when a satellite voice connection has been established.	Conceptual	Concur, change made.
5	Garmin	5	8.12	“The system should provide an indication to the flightcrew in the event of detectable abnormal call terminations or link failures.”	This comment supports the Garmin comment made regarding paragraph 8.7. A “link failure” and “satellite signal lost” could be combined into the same failure from the flight crew’s point of view. Therefore, the need to provide an alert vs. indication should be differentiated by whether a call is active or the system is in standby (no active call)	If the proposed resolution is accepted for section 8.7, then the text of this paragraph is acceptable.	Conceptual	Nonconcur, see response to comment #2.
6	Garmin	B-1	B.3	The sub-section heading states “FAA Technical Standard Order (TSO).”	Paragraph 5.1 refers to both TSO-C159b and TSO-C132. The text in B.3 refers to TSO-C159b but does not have a reference to TSO-C132.	Update the section header to ““FAA Technical Standard Orders (TSOs).” Include instructions for obtaining both TSO-C159b and TSO-C132.	Editorial	Concur, reference to TSO-C132 added.
7	Bombardier Aerospace	4&5	8	To add new paragraph to chapter 8 "FLIGHT DECK ANNUNCIATIONS"	Original AC20-150 from 2/10/06 was requiring in paragraph 7.j "The equipment should give a continuous visual indication when any call is on hold"	"The system should provide a continuous visual indication for any call which is on hold "	Conceptual	Nonconcur, see 8.11 for call indication.

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				ANNUNCIATIONS	This requirement disappeared from the AC20-150A and is not present in the draft of the AC20-150B.	for any call which is on hold.		
8	Bombardier Aerospace	5	9.2	A means should be provided for the flightcrew to terminate a connected call (that is, by manual action).	<p>This requirement was reworded in the AC20-150A dated 8/22/11 as paragraph 9.b and in the draft AC20-150B as paragraph 9.2 "A means should be provided for the flightcrew to terminate a connected call (that is, by manual action)."</p> <p>While this rewording accommodated legacy designs, we believe the present guidance should promote more rigorous interface design standards for any new system installation.</p> <p>We propose to introduce an updated form under chapter 9 "CONTROL CAPABILITY".</p>	<p>Replace paragraph 9.2 under chapter 9 with the following:</p> <p>"A means should be provided for the flightcrew to terminate a connected call (that is, by manual action). Applicants should consider providing the flight crew with the possibility to terminate the call by pressing a single direct access button."</p>	Conceptual	Concur

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9	Iridium Communications	3	6, Section 7.2		Rewrite this as it is not clear between two sentences and use of "Clear" versus preemption is confusing.	If a satellite voice channel is in use and a ground station sends a higher priority call, the satellite voice equipment should preempt a lower priority channel. For an installation with multiple channels which are all in use, the satellite voice equipment should preempt the channel supporting the lowest priority in favor of the higher priority <u>incoming call</u> .	Editorial	Nonconcur; this section is intended to explain the concept of preemption.
10	Iridium Communications	3	9, Section 7.5		Items listed in 7.5 should be broken in 7.5 and new 7.6	7.5 The satellite voice equipment should configure the cockpit default priority to level 2. 7.5 The satellite voice equipment should configure the cockpit default priority to level 2.  7.6 The flightcrew must have the capability to set the priority level for an individual call.	Editorial	Concur
11	Iridium Communications	4	3, Section 8.1 - "more attention-getting annunciation"		Reword	"more alerting annunciation"	Editorial	Nonconcur; the phrase "attention-getting" was specifically used here because it is consistent with the language in Sec. 25.1322(c)(2).

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12	Iridium Communications	5	7, Section 8.10 "In addition, the system may display caller identification (ID) information to the flightcrew for incoming calls, if caller ID is supported by the	This should be must verus may	I think this should be required as the pilot needs to know who is calling them as part of their decision to answer. The satellite provider, if they want to offer ATS, must implement this and then the developers must use the information sent over the satellite network for Call ID in their boxes.	Conceptual	Partially Adopted changed wording to should.
13	Iridium Communications	5	7, Section 8.10 "In addition, the system may display caller identification (ID) information to the flightcrew for incoming calls, if caller ID is supported by the satellite network."	Include that priority of incoming call must also be displayed	"In addition, the system may display caller identification (ID) information and call priority information to the flightcrew for incoming calls, if caller ID is supported by the satellite network."		Nonconcur, priority is in the first sentence of 8.10.

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14	Iridium Communications	5	13, Section 9.3 - "The option to manually dial a full international number should be available to the crew."	Edit to include priority dialing	The option to manually dial a full international number along with call priority should be available to the crew.	Editorial	Nonconcur, see 7.5 for priority dialing requirement.
15	Iridium Communications	7	3, Section 11.8	Edit text size	Change text to be the same size as other sections	Editorial	Comment acknowledged, no change, font size is Times New Roman 12 for all text.
16	Embraer	7	Section 12.2 Paragraph 1	The normal operating procedures of the AFM supplement should identify the criteria used in the airworthiness assessment. For example, "The Federal Aviation Administration has evaluated the S TCOM voice equipment in accordance with AC 20-150B as a required LRCS. Compliance with AC 20-150B does not constitute operational approval."	14 CFR 25.1585(a)(1) specifies that normal procedures should be ". . .peculiar to the particular type or model . . ." and § 25.1585(b) proscribes information ". . .not directly related to airworthiness or not under the control of the crew.. ." in the operating procedures section. Based on input we have received on previous projects, Embraer understands that the statement concerning the approval basis of the satcom voice system is not appropriate for the procedures section	While this section is not part of the proposed changes for Revision B to AC 20-150, Embraer suggests that the guidance in Paragraph 12.2 be revised to specify (or at least leave as an option) to put the statement concerning the approval basis of the satcom voice system in the General or Information section of the airplane flight manual (AFM) or AFM supplement.	Conceptual  Text changed to delete reference to a specific section of the AFM(S). It now simply states this statement should be in the AFM(S).

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17	Boeing Commercial Airplanes	2	<p>Paragraph 5.1 -- DESIGN CONSIDERATIONS</p>	<p>The proposed text states:</p> <p>“5.1. Minimum Performance Standards. The satellite voice equipment should meet Technical Standard Order (TSO) TSO-C159b, Next Generation Satellite Systems (NGSS) Equipment, dated September 29, 2014, or TSO-C132, Geosynchronous Orbit Aeronautical Mobile Satellite Services Aircraft Earth Station Equipment, dated March 25, 2004.”</p>	<p>We recommend revising the text as follows:</p> <p>“5.1. Minimum Performance Standards. The satellite voice equipment should meet Technical Standard Order (TSO) TSO-C159b, Next Generation Satellite Systems (NGSS) Equipment, dated September 29, 2014, or TSO-C132, Geosynchronous Orbit Aeronautical Mobile Satellite Services Aircraft Earth Station Equipment, dated March 25, 2004. Alternatively, the SATCOM system must be installed using an approved Type Certificate, Amended Type Certificate, or Supplemental Type Certificate and meet the remaining requirements of this advisory circular.”</p>	<p>We request that FAA consider allowing aircraft with SATCOM installations approved by Type Certification, Amended Type Certification, and Supplemental Type Certification that do not have TSO approval to use SATCOM voice for ATS services. Most Boeing SATCOM installations do not have TSO approval. SATCOM TSOs were published long after most Boeing aircraft started installing SATCOM systems. However, all Boeing flight deck SATCOM installations are designed with the intent of being used for ATS services and, therefore, meet the remaining requirements of this advisory circular and are technically capable of being used for ATS voice. The wording in the proposed AC (which is admittedly consistent with the previous revision) is inconsistent with the goal of leveraging airline’s existing investment in SATCOM systems that are fully capable of ATS voice communications.</p>	<p>Comment acknowledged, no change required. The language is in accordance with approved template. However, since this requirement is a "should" and not a "must", manufacturers have the option of obtaining approval via Type Certification, Amended Type Certification, and Supplemental Type Certification without obtaining TSO approval for the equipment, as requested in the comment.</p>
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18	Boeing Commercial Airplanes	3	Paragraph 7.2 -- PRIORITY, PREEMPTI ON, AND PRECEDEN CE (PPP)	The proposed text states:  <i>“7.2. If a satellite voice channel is in use and the ground station wants to send a higher priority call, the satellite voice equipment should clear the lower priority channel. If all available channels are in use, the equipment should preempt the channel supporting the lowest priority channel in favor of the higher priority call.”</i>	We recommend revising the text as follows:  <i>“7.2. If a satellite voice channel is in use and the ground station wants to send a higher priority call, the satellite voice equipment or satellite network should clear the lower priority channel. If all available channels are in use, the equipment should preempt the channel supporting the lowest priority channel in favor of the higher priority call.”</i>	We recommend adding the text <i>“or satellite network”</i> due to the fact that the Iridium voice switch performs this function instead of the Iridium SATCOM equipment on board the aircraft. The wording in the proposed AC is only accurate for Inmarsat systems. Iridium SATCOM systems meet the intent of the wording, but comply with the intent using a different technical solution than the proposed wording.	Concur
19			Boeing Commercial Airplanes	5	Paragraph 9.3. - CONTROL CAPABILIT Y	The proposed text states:  <i>“9.3. The use of speed dialing (that is, satellite voice address database), instead of the full international number, should be used wherever possible. The option to manually dial a full international number should be available to the crew”</i>	Many airlines prefer to prevent unauthorized use of SATCOM on the ground by disabling the ability to manually dial a full international number. It is still possible to fully utilize a SATCOM system for ATS voice using stored numbers in the directory, however. ATC telephone numbers are six digits long, and are not blocked from manual dial, and airlines normally store the six digit ATC phone numbers in their telephone directory.

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					The intent of the wording in the proposed AC can still be met, while allowing airlines to retain the flexibility to prevent unauthorized use of the SATCOM system.			
20	Safran Engineering Services	7	11.8	Evaluate the satellite voice communication equipment performance during maneuvering flight.	Since the requested test is left generic, is the following sufficient for "maneuvering flight" tests?: Climbs, descents, right and left turns (360°), and cruise at typical altitudes.	Recommend clear guidance if there are any specific maneuvering flight conditions that the FAA is concerned with.	Conceptual	Comment acknowledged, no change made.
						For example under certain conditions during normal bank turns, the location of the SatCom antenna might lead to the satellite signal being blocked, which would terminate the call. Would this be considered as an unsatisfactory performance of the system?		
21				Evaluate the satellite voice	Section 5.1 of the advisory circular defines that minimum performance standards for the satellite voice equipment should meet TSO-C159b or TSO-C132.	Recommend clear guidance regarding the performance evaluation that should be accomplished		Comment acknowledged, no

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	Safran Engineering Services	7	11.8	Evaluate the satellite voice communication equipment performance during maneuvering flight.	This section (11.8) requires the applicant to evaluate the "equipment performance," but it is not clear the level of performance evaluation required during maneuvering flight, and we are assuming that this is not requiring re-evaluating TSO performance standards in-flight.	Proposal: "Evaluate the satellite communication equipment performance, including voice quality, noise interference, etc. (Add other performance parameters as needed) during...."	Conceptual	Comment acknowledged, no change made. See TSO C-159B reference to MOPS RTCA DO-262B.
22	Safran Engineering Services	1 and A-1	4 and App A	long range communication systems / Long Range Communication Service	The explanation in the Background section uses "long range communication systems" but the acronym list in Appendix A uses the term "Long Range Communicatoin Service".	Resolve "systems" vs. "service" terminology.	Editorial	Concur