

119875

Bell Helicopter **TEXTRON**

DEPT OF TRANSPORTATION

01 JAN -3 PM 12:14

Bell Helicopter Textron Inc.
A Subsidiary of Textron Inc.

Post Office Box 482
Fort Worth, Texas 76101
(817) 280-2011

21 December 2000

Docket Management System
U.S. Department of Transportation
Attn: Rules Docket, Docket No. FAA-2000-7958
400 Seventh Street SW., Room Plaza 401
Washington, DC 20590-0001

FAA-00-7958-5

RE: Comments to Docket No. FAA-2000-7958, Notice No. 00-11, *Noise Certification Regulations for Helicopters.*

Bell Helicopter Textron, Inc. provides the following information in response to FAA's request for comments to change the noise certification regulations for helicopters. BHTI supports the proposed amendment to harmonize the U.S. regulations and the European Joint Aviation Requirements.

Attached are specific comments regarding the section-by-section discussion of the amendment, the wording of the amendment itself, and items that were not covered in the proposed amendment. The comments to the section-by-section discussion describe omissions and errors to the section. These recommended changes to the section are provided to clarify that the changed text is the intent of the amendment.

The comments to the amendment fall into two categories. The first category involves only typographical errors and should be self-explanatory. The second category involves changes to the regulation that BHTI believes were intended by the FAA but overlooked. Most of these changes are to items that appear in multiple areas of the regulations, some of which were not modified as intended.

The comments regarding items that were not covered in the proposed amendment fall into three categories. The first category involves typographical errors that are currently in FAR Part 36 and were not addressed in the amendment. The second category involves minor changes that BHTI feels would clarify FAR Part 36. The third category involves harmonization changes that BHTI feels should have been addressed in the amendment. None of these changes would substantively alter the noise certification levels.



David Snyder
Vice-President
Research and Technology

BELL HELICOPTER TEXTRON INC. COMMENTS ON
DOT/FAA 14 CFR PART 36
DOCKET NO. FAA-2000-7958
NOTICE OF PROPOSED RULEMAKING (NPRM); NOTICE NO. 00-11
NOISE CERTIFICATION REGULATIONS FOR HELICOPTERS

Bell Helicopter Textron Incorporated wishes to make the following comments to Rules Docket No. FAA-2000-7958 regarding the above Notice No. 00-11:

- 1) In the sections preceding the section entitled “Section-by-Section Discussion”, no substantive comments are offered by BHTI.
- 2) In the section entitled “Section-by-Section Discussion”, the following omissions and errors were observed:

Section H36.3

- The numbered sentences should be numbered 1, 2, and 3, rather than 1, 1, and 2.
- Numbered sentence 2 should read “the word ‘air speed’ to indicate”, rather than “the words ‘air speed’ and ‘rotor speed’ to indicate”. The term rotor speed was deleted from the section by the previous sentence.

Section H36.5

- The first paragraph should read “symbols AS, ASr, AT, and ATr”, rather than “symbols ASr, AT, and ATr”. The symbol AS was left out.
- The sentence “The typographical errors; Alr and Anr would be corrected to ALr and ANr.” should be deleted. There is no such error in this section of the published FAR 36 nor is it proposed in Amendment Section 9 of this NPRM.
- The second paragraph should read “amended Figures H1, H2, and H3”, rather than “amended Figures H1 and H3”. Figure H2 was also amended.

Section H36.101

- The fourth paragraph should read “Proposed sections H36.101(b)(6) and H36.101(b)(8) require”, rather than “Proposed section H36.101(b)(6) requires”. Section H36.101(b)(8) contains the third flight procedure that is referred to.

Section H36.107

- Paragraph 3 was inadvertently copied from Section H36.103 without modification and describes the takeoff configuration. It should describe the approach configuration.

Section H36.109

- The two references to section B36.3 should be references to section A36.3.

Section H36.113

- The two references to section B36.7 should be references to section A36.7.

Section H36.205

- In the paragraph starting with “Proposed section H36.205(e)(1) removes the requirement that only the advancing blade tip Mach number”, it is proposed that an alternate procedure be added to correct to reference Mach conditions. However, in the proposed rule, there is no wording that explicitly discusses this alternate procedure. Will this be discussed in an advisory circular?
- In the paragraph starting with “Proposed revision to Figure H2”, the text “and adds symbol Gr” should be added to the end of the first sentence. This symbol has been added to the figure.

Section J36.109

- The three references to section B36.3 should be references to section A36.3.

- 3) In the section entitled “The Proposed Amendment”, the following omissions and errors were observed:

Amendment 8

- The phrase “76 cm mercury” should be deleted, since it is not in SI units and has been replaced by the term “1013.25 hPa”. This same change was adopted in NPRM Notice 00-08 for subsonic jet airplanes.

Amendment 9

- The first paragraph should read “symbols AS, ASr, AT, and ATr”, rather than “symbols ASr, AT, and ATr”. Symbol AS is also no longer used.

Amendment 12

- The reference in H36.105(b) to “an equal number of runs in each direction” implies a physical direction. ICAO Annex 16 Chapter 8 uses a different criterion of requiring an equal number of flights with a headwind as with a tailwind. Since the wind direction can change during a test day, and from day to day, this difference in criteria could require additional flights and different reported EPNLs. Wording should be added to clarify this to use the direction of wind, rather than the physical direction. A reasonable wording would be “an equal number of runs with tail and head wind components”.

Amendment 15

- In H36.111(c)(2), the phrase “reference engine conditions” should be changed to “reference conditions”. The corrections to be made are a function of helicopter

performance and distance only. They are not directly related to, nor are they prescribed for, engine conditions.

Amendment 17

- In H36.205(a)(1)(ii), a period should be added to the sentence ending in “that is different than the reference”.
- Since H36.205(a)(2) was deleted, H36.205(a)(3) should be renumbered to H36.205(a)(2).
- In H36.205(a)(3)(iv), the phrase “, from FAA-approved data in the form of curves or tables given the variation of EPNL with Mach Number,” should be deleted. The method of using curves or tables is now only one of the options available, as changed by H36.205(e). Also, H36.205(e)(2) uses a correction based on a variation of PNLTM with Mach Number, rather than EPNL. Deletion of the phrase would reconcile the difference between the two paragraphs.
- In H36.205(c), the same change noted above for Amendment 12 referring to wind direction should also be made here.
- Section H36.205(e)(2) appears to have been unintentionally deleted. It is noted that this paragraph contained the error of “0.3 Mach”, rather than the correct “0.03 Mach” as was in the original Helicopter NPRM of 1987.
- In H36.205(f)(1)(i), the term “+ α_{io} ” was inadvertently left out of the equation. It should read:

$$SPL_{ic} = SPL_i + (\alpha_i - \alpha_{io}) AL + \alpha_{io} (AL - AL_r) + 20 \log (AL/AL_r)$$

- In H36.205(g)(1)(i), the phrase “measured and corrected takeoff distances” should read “measured and reference takeoff distances”, since AL_r is a reference distance. The changing of the term “corrected” to “reference” was discussed earlier in the NPRM.
- In H36.205(g)(1)(ii), the phrase “and 394 feet is the overhead distance” should be replaced by “and AN_r is the reference distance”. The change from using the overhead distance to using the reference distance to PNLTM made in earlier sections was not corrected in this paragraph.
- In H36.205(g)(1)(iv), the phrase “and 492 feet is the overhead distance” should be replaced by “and AM_r is the reference distance”. The change from using the overhead distance to using the reference distance to PNLTM made in earlier sections was not corrected in this paragraph.

Amendment 20

- In J36.3(c), the phrase “power on maximum normal operating RPM” should be changed to “maximum normal operating RPM”. The term “power on” implies additional meaning to maximum normal operating RPM, which was explicitly defined in §36.1.

Amendment 22

- The reference to appendix B should be a reference to appendix A.

- 4) The following is a list of errors currently in FAR Part 36 Appendix H not identified in NPRM Notice 00-11 that should be addressed and items that were not harmonized with JAR 36 in this NPRM:

Section H36.101

- In H36.101(b)(6)(i), the sentence should read “At least one takeoff test and one flyover test must be conducted”, rather than “At least one takeoff test must be conducted”. This change was implied in the discussion section to the NPRM and is required by ICAO, but the wording was never added.
- In H36.101(c)(7), the time “25 minutes” should be changed to “30 minutes”. This would align Appendix H with ICAO Annex 16 Chapter 8 and NPRM Notice 00-08, where the same change was made.
- In H36.101(d)(1), the reference to Appendix B should be a reference to Appendix A. NPRM Notice 00-08 moved the EPNL calculation procedure to Appendix A.

Section H36.107

- In H36.107(b)(2), the phrase “At a height of 394 ±30 feet (120 ±9 meters)” should be changed to “At a height of 394 ±33 feet (120 ±10 meters)”. This error was apparently due to rounding of the original values. The change would align Appendix H with ICAO Annex 16 Chapter 8 and coincide with the intended 6 ±0.5 degree glide slope requirement.

Section H36.201

- In H36.201(a), the two references to Appendix B should be references to Appendix A. NPRM Notice 00-08 moved the EPNL calculation procedure to Appendix A.
- In H36.201(a)(1), the phrase “Instantaneous perceived noise levels” should be changed to “Perceived noise levels” for clarity. The word instantaneous is not needed and would agree better with the title of the referenced section in Appendix A.
- In H36.201(b), the reference to section B36.5A should be a reference to section A36.4.3.1(a). NPRM Notice 00-08 moved the EPNL calculation procedure to Appendix A.

Section H36.205

- In H36.205(b)(3), the phrase “and Lr is the A and Np corresponding position” should read “and Lr is the corresponding position”. This was a typographical error.
- In H36.205(f)(2)(ii), the reference to (d)(1)(ii) should be changed to (f)(1)(ii). The reference is incorrect.
- Sections H36.205(f)(3) and H36.205(f)(4) should be swapped in position and renumbered. The level flyover flight path correction should be described before

the sideline microphone correction, since the sideline microphone discussion applies to all three flight conditions.

- Sections H36.205(g)(1)(iii) and H36.205(g)(1)(iv) should be swapped in position and renumbered. The level flyover flight path correction should be described before the sideline microphone correction, since the sideline microphone discussion applies to all three flight conditions.

Section J36.105

- The reference in J36.105(b) to “equal numbers of flights in opposite directions” implies a physical direction. ICAO Annex 16 Chapter 11 uses a different criteria of requiring six flights, three with a headwind and three with a tailwind. Since the wind direction can change during a test day, and from day to day, this difference in criteria could require additional flights and different reported SELs. Wording should be added to clarify this to use the direction of wind, rather than the physical direction. A reasonable wording would be “equal numbers of flights with tail and head wind components”.