

## Document Review Comment Log

<b>Title of Document:</b> AC 20-18B, Qualification Testing of Turbojet and Turbofan Engine Thrust Reversers	
<b>Author:</b>	Alan Strom, 781-238-7143
<b>Technical Writer/Editor:</b>	Daniel Tibuni, 781-238-7181
<b>Comments Disposition Date:</b>	April 3, 2015

<b>Committer:</b> • Complete Reviewing Office information and your Comments.						
<b>Reviewing Office</b>						
<b>Organization:</b>						
<b>Comments Submitted By:</b>		Boeing				
<b>Phone:</b>						
#	Name and Mail Stop	Page and Paragraph Number	Comment	Reason for Comment	Recommendation	Disposition/Response to Comment
1		Page 3 Section 7, Paragraph a. Endurance Test	Propose to allow use of a substitute thrust reverser (STR).	The STRs are designed and built to match the aerodynamic lines of the production thrust reversers but do not have the translating hardware of a production unit. This method of compliance has been approved by the FAA on previous Boeing programs	Propose to allow use of a substitute thrust reverser (STR).	Partially agree.  The term 'substitute thrust reverser' is vague. Added the sentence, "Any deviations between the type design thrust reverser and the thrust reverser used during the test must not affect the mechanical or aerodynamic loads on the engine." This will allow use of a thrust reverser that is

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Disposition the comments in the last column. Identify each disposition as:

- Agree;
- Partially Agree;
- Do Not Agree; or
- Agree, but Outside of Scope (will consider in next change/revision).

**Note:** Provide enough explanation or justification to your comment disposition.

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				and results have been acceptable. Our recommended change is consistent with previously FAA accepted methods.		different in some ways from the type design, but requires that the applicant show why those differences are acceptable.
2		Page 3 Section 7, Paragraph b. Calibration test	Propose to allow use of a substitute thrust reverser (STR).	The STRs are designed and built to match the aerodynamic lines of the production thrust reversers but do not have the translating hardware of a production unit. This method of compliance has been approved by the FAA on previous Boeing programs and results have been acceptable. Our recommended change is consistent with previously FAA accepted methods. This is also to be consistent with comment #1.	Propose to allow use of a substitute thrust reverser (STR).	Partially agree.  The term 'substitute thrust reverser' is vague. Added the sentence, "Any deviations between the type design thrust reverser and the thrust reverser used during the test must not affect the performance of the engine." This will allow use of a thrust reverser that is different in some ways from the type design, but requires that the applicant show why those differences are acceptable.

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3	Page 3 Section 7 Paragraph c. Operation test.	Compliance with the § 33.89(b) for operation of the engine during all phases of flight with concern to thrust reverser cycling will be accomplished during the § 33.97(b) thrust reverser cycling testing. Propose to allow use of a substitute thrust reverser (STR) for the rest of operation testing defined in § 33.89.	The STRs are designed and built to match the aerodynamic lines of the production thrust reversers but do not have the translating hardware of a production unit. This method of compliance has been approved by the FAA on previous Boeing programs and results have been acceptable. Our recommended change is consistent with previously FAA accepted	Compliance with the § 33.89(b) for operation of the engine during all phases of flight with concern to thrust reverser cycling will be accomplished during the § 33.97(b) thrust reverser cycling testing. Propose to allow use of a substitute thrust reverser (STR) for the rest of operation testing defined in § 33.89.	Partially agree.  Completion of the § 33.97 (b) thrust reverser cycling is not sufficient to show compliance with § 33.89 with respect to the effect of the thrust reverser on the engine. The purpose of the § 33.97 (b) thrust reverser cyclic test is to demonstrate the endurance of the thrust reverser. It may be possible by instrumenting the engine during the § 33.97 (b) thrust reverser cyclic test to obtain data allowing the test to meet, or partially meet, the requirements of § 33.89. Added the following: "Note that if part or all of the operation test is combined with another test, sufficient data must be captured to meet the requirement of §33.89 that to demonstrate that the engine has safe operating characteristics throughout its
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						<p>specified operating envelope. In the case of the thrust reverser, the specified operating envelope would include any engine and environmental conditions (e.g., airspeeds, altitude, temperature) where the thrust reverser is intended to be used.</p>
4		<p>Page 3 Section 7 Paragraph d. Vibration test.</p>	<p>Propose to allow use of a substitute thrust reverser (STR). Vibration testing may be accomplished with a STR provided the differences between the STR and the production thrust reverser are accounted for analytically. These differences must refer to the dynamic response and flutter margin. Vibration testing during the thrust reverser cycling testing can be used to support this</p>	<p>The STRs are designed and built to match the aerodynamic lines of the production thrust reversers but do not have the translating hardware of a production unit. This method of compliance has been approved by the FAA on previous Boeing programs and results have been acceptable. Our recommended change is consistent with previously FAA</p>	<p>Propose to allow use of a substitute thrust reverser (STR). Vibration testing may be accomplished with a STR provided the differences between the STR and the production thrust reverser are accounted for analytically. These differences must refer to the dynamic response and flutter margin. Vibration testing during the thrust reverser cycling testing can be used to support this</p>	<p>Partially agree.</p> <p>The term 'substitute thrust reverser' is vague. Added the sentence, "Any deviations between the type design thrust reverser and the thrust reverser used during the test must not affect the mechanical or aerodynamic loads on the engine." This will allow use of a thrust reverser that is different in some ways from the type design, but requires that the applicant show why those differences are acceptable. The paragraph</p>

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			analysis.	accepted methods. This is also to be consistent with comments #1, #2 and #3.	analysis.	already says that the vibration test of the engine with the thrust reverser installed may be combined with the operation test of § 33.89 if the applicant can show that the other requirements of §§ 33.83 and 33.89 are complied with.

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