

**Disposition of Public Comments
AC 25.795-2X
Flightdeck Penetration Resistance**

Comment	Requested Change	Disposition
Boeing		
<p>Paragraph 5.c. Change to address areas that are accessible to passengers.</p>	<p>Make the following change:</p> <p><i>“5.c. <u>Hazardous Trajectory.</u> A shotline, from any ballistic threat, originating from any passenger accessible compartment location in the passenger cabin normally accessible by passengers (normally-accessible locations are those areas where passengers would be allowed during a typical flight) that passes through the flight-critical zone defined by flightcrew positions, flight-critical instrumentation, or flight-critical systems within the flightdeck. See <u>Figure 2.—Areas restricted by panels requiring tools or keys to access or areas restricted to crew and/or maintenance personnel need not included in the shotline review. Ballistic protection would also be expected to occur at the flightdeck floor and ceiling if on a direct hazardous trajectory from the passenger compartment.</u>”</i></p>	<p>Generally, the idea of defining an “accessible area” is a good one. This definition is discussed in the preamble to the rule and in AC 25.795-1A. However, simply <i>not allowing</i> passengers access, for example, by placarding an area “For Crew Use Only” will not address the security issue, since the people of concern are not likely to obey a placard. However, panels requiring tools or doors locked with keys would provide sufficient delay or deterrent to make them inaccessible for the purposes of this rule. Therefore, we have expanded discussion of the definition, which parallels the language in the preamble of the rule.</p>
<p>Add a new Paragraph 5.j. to define “passenger accessible areas.”</p>	<p>Add a new paragraph, as follows:</p> <p><i>“5.j. <u>Passenger Accessible Areas.</u></i></p>	<p>As noted above, the use of a placard is not by itself sufficient to deter access in this context. Otherwise, the proposed definition is essentially embodied by the</p>

**Disposition of Public Comments
AC 25.795-2X
Flightdeck Penetration Resistance**

Comment	Requested Change	Disposition
	<p><i>Normally occupied passenger locations in the aircraft are those areas that are bounded by ceiling panels, lining panels, outboard closeout panels between such things as lavatories, closets and galleys and the side wall lining panels which require tools and/or keys to access. Areas which are not considered to be normal passenger occupied locations are those areas which are placarded “restricted areas” where passengers would not reside during a typical flight. These areas include but are not limited to crew rests, E/E bays, lower galleys, and closet areas.”</i></p>	<p>changes to Paragraph 5.c which are discussed above.</p>
<p>Add new Paragraph 5.k. Testing of feature details produce varying results, depending on where the bullet strikes the detail. An example is butt joints. If the bullet were to strike the ballistic material <u>outside</u> the butt joint, then the detail feature is not fully tested. On the other hand, if it strikes <u>on</u> the butt joint, the bullet will have a tendency to separate the ballistic materials. Therefore, it is critical that the impact location be controlled.</p>	<p>Add a new paragraph, as follows:</p> <p><i>“5.k. <u>Ballistic Impact Location.</u> The ballistic impact location is that location which is defined as an area which is equal to a circular zone with a radius of 1.5 bullet diameters from the intended impact location (i.e., for the 44 magnum it would be $.432/2 + .432 = .648$ inch radius circle. Any part of the bullet impacting outside of this zone must be performed again.”</i></p>	<p>We agree that a shot that misses the detail of interest is not valid and must be repeated. However, applicants have been very accurate with shots; thus this has generally not been an issue or in question. A new paragraph is not necessary; however, we discuss the need for accuracy and the general accuracy necessary in Paragraph 10.c.(8)</p>

**Disposition of Public Comments
AC 25.795-2X
Flightdeck Penetration Resistance**

Comment	Requested Change	Disposition
Paragraph 7.d.(2). Change to explain the difference between tests on a feature and tests on the basic panel.	According to the commenter, the text in the proposed AC could lead one to believe that material testing must be applied to features if the certifying applicant is unsure of the outcome. Therefore, “ballistic material tests” requiring six test shots—two at 30 degrees and four at 0 degrees—must be performed on the feature. This expectation is impractical and cannot be accomplished on small features.	There is no intent to require the same six shots on a feature as on the basic ballistic material. The AC language is actually addressing the pass/fail criteria, not the number of tests required. However, we have changed the language in the AC to remove ambiguity.
Paragraph 7.d.(2)	Suggests that the statement be revised to read as follows: <i>“7.d.(2)...Surfaces of protective material that are butted flush against each other may also be acceptable without testing, if it is clear that penetration is not an issue on a hazardous trajectory, or the ballistic impact does not degrade the penetration resistance of the material.”</i>	We agree and have revised the paragraph, as suggested.
Paragraph 8.g. Discuss potential effects of moisture further.	The commenter says that ballistic materials can accumulate moisture while in storage. The company has experience with such materials not maintaining their ballistic resistance properties. Therefore, it recommends adding the following language:	We have revised the AC is revised to mention the potential for moisture absorption in storage. However, the suggested change would require the applicant to perform a much more extensive assessment (possibly including tests) than should be necessary, given the

**Disposition of Public Comments
AC 25.795-2X
Flightdeck Penetration Resistance**

Comment	Requested Change	Disposition
	<i>“Testing of the ballistic material in a humidity environment such as that seen by an aircraft in service will be required, unless it can be shown that the material’s ballistic properties do not degrade with increased humidity levels, or it can be shown that the material is protected via another means such as, but not limited to, resins and covers.”</i>	low humidity experienced on board commercial airplanes. Accordingly, we have not adopted the additional suggestions.
International Coordinating Council of Aerospace Industries Association		
Paragraph 8.i.(2) Explain more on discontinuity in other than the door.	Figure 3, showing a discontinuity in the door, could also apply to another part of the boundary and might be interpreted as limited to doors.	We have added the words “or panel” to the figure, so that there is no confusion.
Boeing		
Paragraph 8.j. Add mention of other environmental effects.	This paragraph should be revised to mention the effects of cleaning or other environmental or in-service conditions.	The intent of this paragraph is to note that aging, per se, has not been an issue. Other environmental effects are not discussed because the effects are not known. An applicant should provide Instructions for Continued Airworthiness as well as cleaning instructions, if applicable, that ensure that the requirements continue to be met. We have noted this point in the AC.

**Disposition of Public Comments
AC 25.795-2X
Flightdeck Penetration Resistance**

Comment	Requested Change	Disposition
<p>Paragraph 10.c.(7). Remove the phrase regarding damping and energy absorption.</p>	<p>Delete the following sentence: <i>“The test-panel fixture should not provide a significant increase in damping or energy absorption compared to the airplane configuration.”</i></p>	<p>We agree. The AC already addresses the critical case and a conservative representation. The deleted words don’t add to that discussion.</p>
<p>Paragraph 10.c.(7). Remove phrase regarding panel thickness to be consistent with Paragraph 10.c.(4).</p>	<p>Delete the sentence: <i>“Through-thickness The test panels should be tested in dry conditions.”</i></p>	<p>Paragraph 10.c.(4) refers to the methods of construction, and doesn’t conflict with this paragraph. Panels could have the same basic methods of construction but be of different thickness depending on location and other requirements of the panel. This sentence is basically including panel thickness as a consideration. It was part of the original AC and did not cause confusion. Thus we have not changed it.</p>
<p>Paragraph 10.c. Add a new paragraph to address shots at detail features.</p>	<p>Add a new paragraph to discuss the requirements for shots at detailed features, rather than just the basic panel material.</p>	<p>We agree and have inserted a new paragraph after paragraph 10.c.(7); the following paragraphs are re-numbered accordingly.</p>
<p>Paragraph 10.c. Specify and permit impact of witness sheet. Limit failures to penetrations of an aluminum witness</p>	<p>Rewrite the paragraph, as follows: <i>“Test Procedures. This procedure provides</i></p>	<p>The proposed change would significantly change the level of penetration resistance and permit penetration of the airplane</p>

**Disposition of Public Comments
AC 25.795-2X
Flightdeck Penetration Resistance**

Comment	Requested Change	Disposition
sheet. Also suggest parallel changes in paragraph 10.	<p><i>an acceptable method to demonstrate adequate protection for the flightdeck against ballistic threats. The tests demonstrate the ability of the shield to prevent bullet penetrations <u>of the witness sheet with a pass/fail criterion. In order to pass, all portions of the projectile must be stopped by the shielding or slowed to such a point as to not allow penetration of the witness sheet, on each of the required tests. Penetrations in the witness sheet of any kind by the bullet or a fragment is a failure. Dimpling or deformation of the witness sheet without any fracture of the surface will be considered as a pass and is acceptable.</u></i></p>	<p>features, as long as the metal witness sheet is not penetrated. The focus of the criterion has been on penetration of the airplane features (which is, admittedly, different from what is permitted for some of the law enforcement tests). The current level was successfully met for the flightdeck door and is attainable for the remainder of the boundary. However, we agree that tiny fragments with no energy are not “penetrations” and should not be cause for failure. We have revised he AC to address this matter by permitting penetration of a butcher paper witness sheet to determine acceptability.</p>
<p>Paragraph 11.a. Add a sentence to include a valid shot on features, as proposed in paragraph 5.k.</p>	<p>Add a sentence that refers to Boeing’s previously-proposed wording in paragraph 5.k., concerning striking a feature within 1 ½ bullet diameters.</p>	<p>As discussed earlier, applicants have been very accurate with their shots and have not had a problem. However, it bears mention that a valid shot must hit the feature being tested. So, we have added language to that effect to the AC.</p>