

Honeywell

144465

Robert D. Johnson
President & CEO
Aerospace

Honeywell
1944 E. Sky Harbor Circle (85034)
P.O. Box 29003
Phoenix, AZ 85034-9003
602 365-2629
602 365-2635 Fax

FAA-2001-11032-2

November 29, 2001

Mr. Nicholas Sabatini
Associate Administrator for Regulation and Certification
Federal Aviation Administration, AVR-1
10A, Room 1000W
800 Independence Avenue, SW
Washington, DC 20591

01000-01000-00010
DEPT OF TRANSPORTATION

Dear Mr. Sabatini:

I am writing to express Honeywell's strong concern about a November 8 letter addressed to you from the Aerospace Industries Association, Air Transport Association and European Association of Aerospace Industries regarding proposed cockpit door standards. These concerns apply to cockpit door standards both for reconfiguration of existing aircraft as well as configurations for new aircraft. As you know AIA has withdrawn its endorsement of the Attachments to the November 8 letter.

The proposed standards included in the letter inappropriately weaken commonly used ballistic testing standards developed and refined after extensive testing by the National Institute of Justice for personal body armor, and ballistic resistant protective materials (Standards for Ballistic Resistance of Personal Body Armor - 0101.04 and Standard for Ballistic Resistant Protective Materials - 0108.01). In addition, the proposed standards fail to require testing of ballistic materials in the environment in which they will be subjected to in normal daily operations- temperatures and humidity actually experienced in the cabin, whether or not the aircraft is in flight. We believe this is critically important as some materials absorb moisture resulting in a degradation of ballistic-resistant properties.

The document included several indications of product bias. For example, Section 4 to Attachment 2 of the proposed standards asserts that woven fabrics are superior to composites in providing ballistic protection, but no rationale is provided. While this may seem innocuous, it could be interpreted to preclude the use of a composite material such as Honeywell's Spectra Shield® which is widely used in a variety of applications, including soft body armor in military and law enforcement agencies throughout the world, and hard armor in vehicles, hand-held riot shields, helmets and breastplates. In fact, as a rough rule, Honeywell's Spectra Shield® material in rigid composite form is 30-50% lighter than other fibers utilizing similar constructions providing equivalent protection.

Similarly, Attachment 1 and 2 state that tests should be conducted at a specific temperature and a specific humidity, and that "No additional environmental effects need be considered for the test." Spectra Shield® is moisture resistant and therefore will test well in a variety of moisture conditions. Competitive materials are known to absorb moisture resulting in degradation of ballistic-resistant properties. This is one reason many police departments prefer Spectra Shield® in bullet resistant vests. In fact, one of Honeywell's customers suggested to us that the great variability in cockpit humidity conditions is one of the main reasons they prefer Spectra Shield.®

The basic data provided in the Attachment 2, *Pilot Compartment Penetration Resistance*, comes from a research report in May, 2000 by SRI International, *Fourth Workshop on Uncontained Engine Debris Characterization, Mitigation and Modeling*, Aircraft Catastrophic Prevention Program. Honeywell Aerospace manufactures aircraft turbine engines and has FAA-certified methodology for determining the ballistic characteristics of contained and uncontained engine failures. But the threat of bullets is different from the threat of engine debris and requires different ballistic engineering. Therefore, any suggestion that one material has better characteristics than another is referencing data that is not pertinent to the cockpit door reinforcement application.

Specifically we urge the FAA when developing any Advisory Circular or NPRM on strengthened cockpit door standards to consider the following changes to Attachment 2 (*Pilot Compartment Penetration Resistance*) of the aforementioned November 8 letter:

1. Delete section 4. Principles and Techniques. (pages 4-5) This section appears to serve no purpose other than to defend the use of a woven fabric as a preferred ballistic material. It is replete with unsubstantiated statements of product bias. When claims are made no reports or data are cited to substantiate those claims. When studies are cited they are often decades old and do not account for materials invented after the reported research was completed.
2. Strengthen Test Procedures, section 6a. (page 7) Elements of NIJ standards 0101.04 (Standard for Ballistic Resistance of Personal Body Armor) or 0108.01 (Standard for Ballistic Resistant Protective Materials) should be used. The 0101.04 standard does not allow protrusions. The 0108.01 standard allows for protrusions but an aluminum witness plate is placed 6 inches behind the test panel to validate penetrations. The proposed standard in Attachment 2 inappropriately allows for the bullet to protrude through the ballistic shielding. A proper test should not allow for protrusions as stated in the NIJ 0101.04 standard or an aluminum witness panel should be placed 6 inches behind the test panel to validate penetrations as stated in the NIJ 0108.01 standard. Thus, the last sentence of section 6a ("Partial penetrations of the bullet through the shielding are acceptable.") should be deleted. In addition the second sentence of section 2.f. on page 2 should be deleted ("Any portion of the bullet may protrude from the test panel.")
3. Strengthen Test Procedures, section 6a (3) Ambient Test Conditions. (page 7) The proposed standard inappropriately limits testing of ballistic materials to only one temperature and humidity range. This range does not account for the varying environments actually experienced in the cabin, including varying temperatures and humidity levels before, during and after flight. A better approach is to simply use the NIJ 0101.04 testing protocol. Therefore section 6.a. (3) should be deleted ("(3) Ambient Test Conditions.").

We would appreciate the opportunity to work with your organization as you develop cockpit door standards to ensure that the standards can be applied fairly to all ballistic materials. I look forward to hearing from you.

Sincerely,



Bob Johnson

/lm
