OTA Report Brief

August 1992

Police Body Armor Standards and Testing

Most U.S. police officers serving large jurisdictions have bullet-resistant body armor, typically a soft undergarment designed to be worn routinely to stop certain handgun bullets. Bulkier, conspicuous vests designed to stop rifle bullets are often worn for particularly dangerous operations. By industry estimates, body armor has saved more than 1,300 police from death or serious injury by assaults with firearms (40%), other assaults (20%), and accidents (40%).

Would-be purchasers can see how much of the body an armor garment covers but cannot judge what bullets the armor will stop or what injury stopped bullets might cause. To provide benchmarks for bullet-stopping ability, the National Institute of Justice (NIJ) has specified tests in NIJ Standard 0101.03. The latest in a series, the standard has been controversial since it was issued in 1987.

Samples of a model of armor may be tested by either the manufacturer or NIJ. If the *samples* pass, the *model* may be certified to comply with the standard. Uncertified armor may be sold, but may not be labelled as complying with the standard.

Of the 555 models tested under NIJ supervision before November 1991, 329 passed and 221 failed (5 tests were inconclusive). The NIJ-certified models have performed as expected in the field, but uncertified armor, some of which would probably fail the test, has also performed as advertised. Critics charge that the test is more stringent than necessary to guarantee safety, so that safe armor may fail the test unless made so thick that it is uncomfortable and, as a result, not always worn, costing lives.

The controversy has been about the details of the test procedure. However, the controversy cannot be objectively resolved until the tests are put on a firmer scientific basis, specifically until maximum acceptable risks are specified explicitly. The OTA report describes a procedure for doing this.

OTA's analysis of a limited number of industry-sponsored tests of armor actually involved in assaults on police officers provides high confidence that armor that would pass the NIJ test would reliably protect a wearer from serious injury by a stopped bullet of the type and velocity used in the test. More such reenactments are needed to assess how reliably the test passes safe armor.

Critics claim that test results are not reproducible, because samples of certified models, seemingly identical to the samples that passed the certification test, have failed subsequent tests. This could happen by chance or because of uncontrolled variations in manufacturing and testing. OTA describes three steps for remedying the situation:

1. Reducing variation in test conditions.
2. Basing certification on multiple tests (or on a test that results in a score) in order to average out insignificant chance variations. This could make both the risk, to consumers, of certifying unreliable armor, and the risk, to producers, of denying certification to reliable armor, as low as desired.
3. Establishing a quality-control program to assure that production armor is as good as test samples.

OTA concludes that the standard's requirement that half the samples be sprayed with water before being tested is unnecessary and could be made optional. Some fabric armor that would pass when dry might fail after being sprayed, unless it is made thicker, treated to repel water, or encapsulated in a waterproof cover, all of which increase the discomfort perceived by some wearers. Non-waterproof armor is rarely wetted enough in service to lose its advertised dry ballistic resistance.

OTA estimates that only about a third of all officers are wearing armor when shot. If all officers wore armor at all times, another 10 to 30 per year would be saved from fatal gunshot wounds.

Options for Congress

Congress could enact H.R. 322, the Police Protection Act of 1991, which would prohibit sale of armor not certified to comply with the current NIJ standard (or any future revision thereof) and would authorize NIJ to enforce the ban. This expanded jurisdiction would overlap and could conflict with that of the Occupational Safety and Health Administration (OSHA).

H.R. 322 would also require manufacturers to submit "representative samples" of certified models

of armor to NIJ periodically to be tested for continued compliance. The bill does not specify details of the sampling and testing, which are key to assessing the effectiveness of the quality-control provision.

Congress could fund an NIJ-supervised voluntary quality-control program to assure customers that the certified armor sold by participating manufacturers has the certified ballistic resistance. Congress could fund an NIJ market-surveillance program to deter and detect false advertising or labeling of uncertified armor as certified. Cases could be prosecuted by the FTC, which might require additional funding.

Congress could fund research to correlate penetration in testing with penetration in assaults, evaluate alternative penetration-test procedures, and develop and validate a method for predicting the risk of injury by a stopped bullet, based on the measurements made in the NIJ test or on additional types of measurements that might be made.

Copies of the report for congressional use are available by calling 4-9241.

Copies of the report for non-congressional use can be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325 (202) 783-3238. The GPO stock number for the OTA report, "Police Body Armor Standards and Testing," is 052-003-01292-8. The price is $3.25.

For further information contact OTA's Publications Office. Address: OTA, U.S. Congress, Washington, DC 20510-8025 (202) 224-8996.

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