

## Body Armor Follow-Up Testing Component Launched

**E**mployees came to work at ABC Body Armor Manufacturing on a summer morning thinking it was just another workday. They didn't know that a significant event in company history would occur that afternoon: The facility would receive its first unscheduled visit from an inspector contracted to the Office of Justice Programs' National Institute of Justice (NIJ) Body Armor Compliance Testing Program (CTP).

Administered by the National Law Enforcement and Corrections Technology Center (NLECTC)-National for NIJ, the follow-up CTP testing process began in August 2010. The focus is on an abbreviated form of the initial ballistic testing (fewer tests, on two samples only), construction comparison between production samples and the samples submitted for initial compliance testing, and comparison of current and original manufacturer build sheets.

The onset of follow-up testing marks the final step in an extensive revision to the NIJ Body Armor Compliance Testing program triggered by a June 23, 2003, shooting in Forest Hills, Pa., in which Officer Edward Limbacher was seriously injured by a suspect's shot that penetrated his body armor. The incident, which involved an armor constructed primarily of a fiber called Zylon®, touched off five years of intensive research, focus group meetings and intense scrutiny of the entire testing program and the standard behind it. The end result, officially launched in December 2008, included a revision to the standard (*Ballistic Resistance of Body Armor, NIJ Standard-0101.06*) and a complete restructuring of the entire program, including the addition of follow-up inspection and testing. (For more details, see a series of related articles in *TechBeat* Spring 2009, <http://www.justnet.org/Pages/TechBeatIssue.aspx?issue=Spring+2009>.)

Under this new process, inspections and testing of collected samples occur every 10 months, but frequency may be reduced to every 20 months if the manufacturing location's quality management system is certified to BA 9000. BA 9000 mirrors *ISO 9001:2008*, a standard for quality management from the International Organization for Standardization, and provides for the implementation of ISO 9001 requirements specific to body armor.

Implementation of BA 9000 provides greater confidence that the manufacturer consistently produces armor meeting the design specifications of body armor initially type tested by the CTP. Manufacturers' compliance with BA 9000 requirements will be inspected by ANAB, the national accreditation board of ANSI-ASQ (for more information, visit <http://www.anab.org/>).

"The introduction of the follow-up testing process is the next phase in the evolutionary development of the CTP," says Lance Miller, NLECTC-National director. "The test process itself has been redesigned with the idea that it is no longer 'once and done.' We have been testing armor to this version of the standard for more than a year now, and we have a sufficient number of compliant models on our Compliant Products List to begin the next step in the process. This next step will ensure that the ongoing production of these compliant models is consistent with what the manufacturer originally submitted to the CTP and was tested and approved."

More than 3,000 law enforcement officers' lives have been saved by body armor since the mid-1970s, when NIJ began testing body armor and developing performance standards. During that time, the NIJ standard and its testing program have gained worldwide recognition as denoting the benchmark for ballistic-resistant armor performance. The addition of the follow-up testing component ensures that NIJ will continue to raise the bar when it comes to testing body armor performance.

"Implementing follow-up testing will increase the confidence that law enforcement has in body armor performance because we will no longer rely entirely on initial testing, inspection and evaluation," says Jamie Phillips, conformity assessment coordinator for NLECTC-National. "Most manufacturers realize the importance of maintaining production armor consistency and will not introduce untested variations. Some, however, may underestimate the impact of minor changes and the associated risks."

Phillips explains that in many cases, manufacturers that change a product have done so because of issues with their suppliers, and they don't realize the effect that might have

on product performance. For some products, this might not cause major consequences, but for body armor, he says, “There could potentially be a significant impact on human life if the substitution fails to perform appropriately.”

Because of that potential impact on life and the complexity of launching this new CTP component, the start of follow-up testing did not closely follow the January 2009 switch to testing new armor models under the 0101.06 revision to NIJ’s Ballistic Resistance of Body Armor standard. Although other conformity assessment programs with follow-up inspections exist, body armor has certain unique aspects that required additional thought to provide confidence without inflicting significant costs that would eventually be paid by practitioners. This included the selection of Underwriters Laboratories Verification Services to provide independent and certified inspectors. In addition to pulling samples to go to the test laboratories, these inspectors will also collect purchasing documentation for the ballistic material used in armor construction for review by the NIJ CTP.

“Officers want to know that the armor they put on every day provides the protection it should,” says Alex Sundstrom, NLECTC-National compliance testing program coordinator. “They want to feel confident that it will perform as specified, and the careful planning that went into creating the follow-up testing component will increase that confidence.”

CTP staff expect the first year of follow-up testing to be somewhat of a pilot year with issues being addressed and resolved as they arise. The CTP started with the first models to receive compliance status in early 2009, and is working to eliminate the backlog and get products on the 10- or 20-month cycle.

In the event that there is a failure, the manufacturer will need to supply the CTP with information on which agencies have purchased that armor. The CTP will then work with the manufacturer to determine the root cause of why the armor failed, and whether the failure presents any officer safety concerns. As a result of this review, the CTP will determine what actions the manufacturer must take to ensure the continued safety of officers in the field.

*For more information on follow-up testing and the Compliance Testing Program in general, visit <http://www.justnet.org/Pages/ctp.aspx>. Debra Stoe is the NIJ program manager for Standards and Testing; contact her at [Debra.Stoe@usdoj.gov](mailto:Debra.Stoe@usdoj.gov).*

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## FOLLOW-UP TESTING Q&A

The questions and answers below are adapted from those asked at a body armor manufacturers’ workshop sponsored by NIJ and facilitated by NLECTC in 2010. Although many of their questions focused on issues that interest only manufacturers, a few touched on issues that may impact areas of concern to law enforcement officers, such as the impact of implementing follow-up testing on procurement and whether the samples tested will truly represent production armor.

- Q: If the inspectors find a minor change that does not impact ballistic capability, such as a color change, will the manufacturer be required to submit this for testing as a new model? Many manufacturers have long-term contracts with law enforcement agencies and they might be impacted if a model has to be resubmitted.
- A: It would only have to be resubmitted if the change impacts the ballistic capability. In that case, it would have to go through the entire process again.
- Q: How will the inspectors select the samples that will be pulled?
- A: We would like to be able to select samples that represent what is going out the door. We don’t want samples that were prepared just for the inspectors. The only way to accomplish this is to essentially do unscheduled inspections.
- Q: Pulling a production sample could impact ability to make a delivery, since armor is built to order.
- A: Unfortunately, to accomplish what we really need, that may have to happen. We had talked about other ideas, such as taking a vest from an officer on the street, and we do not feel this is appropriate.
- Q: How will a test lab be selected? If an inspector pulls several models, will they all go to the same lab at the same time?
- A: When we send inspectors out, we will identify the lab that did the initial compliance testing, and send them to a different lab for the follow-up testing if possible.
- Q: Are there any further developments regarding testing of used armor?
- A: We are just beginning to look at a test methodology for used armor. It’s a long-term effort; you’re looking at five to 10 years. It’s a tough nut to crack. We are trying to schedule a meeting later this year to bring together some experts.



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