

Soldier Protection System (SPS)

The Army started early fielding of the Second Generation Modular Scalable Vest (MSV Gen II) and Third Generation Vital Torso Protection (VTP Gen III) hard armor plates in 4QFY21 to a select number of soldiers. Eight of the thirteen VTP Gen III designs passed First Article Testing, proceeding to the next phase of live fire testing that is currently ongoing. The Army intends to field VTP Gen III systems to the broader Army starting in 4QFY22 through 4QFY25 after the completion of testing. The Next Generation Integrated Head Protection System (IHPS) is under development, with First Article Testing planned for 3QFY22.



System Description

The SPS is a suite of personal protection subsystems intended to, at a reduced weight, provide equal or increased levels of protection against small-arms and fragmenting threats compared to existing personal protection equipment. The SPS subsystems are designed to protect a soldier's head, eyes, and neck region; the vital torso and upper torso areas (including the extremities); and the pelvic region. The SPS is a modular system and provides soldiers the capability to configure the various components into different tiers of protection depending on the threat and the mission. The SPS consists of three major subsystems, shown in Figure 1.

Program

The SPS program is an Acquisition Category III program comprised of three major subsystems depicted in Figure 1. Each of the three major subsystems are developed, tested, and fielded independently. The Army entered the TEP full-rate production in September 2016, the IHPS in October 2018, and the VTP in December 2019. Each subsystem has follow-on engineering change proposal efforts: MSV Gen II is replacing the initial MSV in TEP; VTP Gen III is replacing previous generations of VTP; and the Next Generation IHPS is replacing the IHPS. The Army is not planning a formal acquisition decision for the VTP Gen III, despite the significant design changes from VTP Gen II. The Army started an early fielding of MSV Gen II and VTP Gen III plates in 4QFY21 to a select number of soldiers as authorized by the Army G8 on February 16, 2021.

Major Contractors

- TEP Full-Rate Production Vendors/Designs (multiple vendors to stimulate competition and achieve best price through Fair Opportunity awards):
 - Armor Express – Eden, North Carolina (MSV, BPP).
 - Bethel Industries Inc. – Jersey City, New Jersey (MSV, BPP).

- Slate Solutions – Sunrise, Florida (MSV).
- Point Blank Enterprises, Inc. (Protective Apparel & Uniform) – Pompano Beach, Florida (BCS).
- Carter Enterprises Industries Inc. – Brooklyn, New York (BCS).
- Eagle Industries Unlimited – Virginia Beach, Virginia (BCS).
- VTP Full-Rate Production Vendors:
 - Engense Armor Systems – Camarillo, California (ESBI).
 - Florida Armor Group – Miami Lakes, Florida (ESBI).
 - Leading Technology Composites – Wichita, Kansas (ESAPI, ESBI).
 - TenCate Armor – Hebron, Ohio (ESAPI, XSBI).
 - Avon Protection/Ceradyne – Irvine, California (XSAPI, ESAPI, XSBI).
- IHPS Vendor:
 - Avon Protection /Ceradyne – Irvine, California.
- NG IHPS Vendor:
 - Avon Protection /Ceradyne – Salem, New Hampshire.

- Gentex Corporation – Carbondale, Pennsylvania.

Test Adequacy

The Army is currently executing Lot Acceptance Testing on the eight VTP Gen III plates that have passed First Article Testing. The Army completed First Article Testing on a production of a single XXL size of the IHPS in 2QFY21. Both test series were conducted at Aberdeen Test Center, Maryland in accordance with DOT&E-approved test plans. Test planning for Next Generation IHPS is ongoing and scheduled to begin in 3QFY22. The Army plans to complete additional testing in 1QFY21 to enable the comparison of legacy VTP and SPS VTP Gen III plates against nonstandard threats.

The Army's ballistic testing of the VTP Gen III plates is being performed in accordance with the DOT&E-approved strategy but does not include an assessment of potential injuries to soldiers wearing body armor. In order to adequately assess soldier protection in the future, the Army must accredit the available mannequins for evaluating injuries and fully verify, validate, and accredit the Army's modeling and simulation tools to accurately evaluate VTP as a penetrable material.

Figure 1.
Soldier
Protection
Subsystems



Performance

Five of the thirteen VTP Gen III designs (a combination of ESAPI, ESBI, XSAPI, and XSBI designs) did not meet the ballistic First Article Testing requirements. Final assessments of the VTP performance will be published after the completion of testing in 2QFY22 to inform the SPS fielding decision to the broader Army in 4QFY22. This assessment will include a comparison between the legacy VTP and VTP Gen III performance.

The XXL IHPS design submitted for First Article Testing in FY21 met its ballistic requirements.

Recommendations

The Army should:

1. Improve modeling and simulation capabilities so that penetration, threat breakup, and fragment behavior can be assessed on ceramic hard armor plates for a range of conditions not tested.
2. Reinitiate their efforts to accredit a mannequin as an evaluation tool for assessing injuries from penetrating threats in body armor testing.