

# Soldier Protection System (SPS)

The Army continues to field the Second Generation Modular Scalable Vest (MSV Gen II) and Third Generation Vital Torso Protection (VTP Gen III) hard armor plates, with fielding expected to complete in 4QFY28. The Army started fielding of the Second Generation Integrated Head Protection System (IHPS Gen II) in February 2024. Since last year's Annual Report, the Army completed First Article Testing (FAT) for multiple vendors and over 250 Lot Acceptance Tests (LATs) for all Soldier Protection System (SPS) systems, with one LAT failure. DOT&E provided a briefing package to the House Committee on Armed Services in November 2023, on female soldier and marine protective equipment systems.

## SYSTEM DESCRIPTION

The SPS is a suite of personal protection subsystems. The Army intends to provide equal or increased levels of protection against small-arms and fragmenting threats compared to existing personal protective equipment (PPE) at a reduced weight. 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 their mission. 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 consists of three major subsystems: Torso and Extremity Protection (TEP) system, Integrated Head Protection System (IHPS), and the Vital Torso Protection (VTP) system. Each subsystem is further comprised of multiple components.

## MISSION

Units will accomplish assigned missions with soldiers wearing the SPS, which provides protection against injury from a variety of ballistic (small-arms and fragmenting) threats.



### Torso and Extremity Protection (TEP)



**Modular Scalable Vest (MSV)**



**Ballistic Combat Shirt (BCS)**



**Blast Pelvic Protector (BPP)**

### Integrated Head Protection System (IHPS)



**IHPS Base Helmet**



**IHPS with Mandible and Visor**

### Vital Torso Protection (VTP)



**Enhanced Small Arms Protective Insert (ESAPI)**



**Enhanced Side Ballistic Insert (ESBI)**



**Xensoteria Small Arms Protective Insert (XSAPI)**



**Xensoteria Side Ballistic Insert (XSBI)**

## PROGRAM

SPS is an Acquisition Category III program comprised of three major subsystems. Each of the three major subsystems is developed, tested, and fielded independently. The Army entered full-rate production of the TEP system in September 2016, the IHPS in October 2018, and the first generation of the VTP system 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
- IHPS Gen II, formerly known as Next Generation-Integrated Head Protection System (NG-IHPS), is replacing IHPS

The Army is modernizing the VTP program to offer multiple Personal Protective Equipment Posture (PPEP) levels and provide warfighter protection scalability, and mobility. The Army is adjusting its ballistic protection requirements to align with these PPEP levels.

The Army started early fielding of MSV Gen II and VTP Gen III plates in 4QFY21 and plans to field through 4QFY28. The target acquisition quantity is approximately 150,000 sets of each of the SPS torso subsystems. The Army started fielding of the IHPS Gen II in February 2024 to the 82nd Airborne Division.

DOT&E, in coordination with the Program Executive Officer Soldier and the Commander of Marine Corps Systems Command, provided a briefing package to

the House Committee on Armed Services in November 2023 in response to National Defense Authorization Act for Fiscal Year 2023, on female soldier and marine protective equipment evaluation and what, if any, processes are in place to ensure future body-worn systems are evaluated for fit and appropriate wear through the 98th percentile of all possible sizes.

## » MAJOR CONTRACTORS

### TEP Vendors:

- 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 (MSV, BCS)
- Carter Enterprises, LLC – Brooklyn, New York (BCS)

#### **VTP Vendors:**

- Engense, Inc. – Camarillo, California (ESBI)
- Florida Armor, LCC – Miami Lakes, Florida (ESBI)
- Leading Technology Composites, Inc. – Wichita, Kansas (ESAPI, ESBI)
- Integris Composites – Hebron, Ohio (ESAPI, XSBI)

#### **IHPS Gen II Vendors:**

- Avon Protection – Salem, New Hampshire
- Gentex Corporation – Carbondale, Pennsylvania

## **TEST ADEQUACY**

The Army conducts multiple FATs and LATs every year to qualify new vendors and designs. In FY24, the Army completed FAT for multiple vendors to include: MSV and VTP's Enhanced Small Arms Protective Insert (ESAPI) designs. The designs that passed FAT proceeded to LAT. The Army completed all test series at Aberdeen Test Center, Maryland, in accordance with DOT&E-approved test plans. DOT&E observed most of the FAT testing. The Army completed an expanded developmental test (DT) series for VTP Gen III ESAPI against nonstandard fragmenting threats for one vendor in 1QFY24 and

expects to complete the series for a second vendor in 1QFY25.

In 1QFY25, the Army conducted expanded DT of the IHPS Gen II to evaluate its protective capabilities against threats that surpass the standard requirements tested in FAT and LAT. The testing also included additional engagement conditions, such as oblique angles and various velocity regimes and comparisons with the legacy IHPS helmet. The Army intends to conduct full-up system level testing in 2QFY25 in accordance with a DOT&E approved test plan to assess potential injuries to soldiers from threats that penetrate the IHPS Gen II, and to compare the results with the legacy IHPS protection. DOT&E plans to publish a survivability report in 3QFY25.

In response to a recommendation in the FY23 Annual Report, the Army has taken steps to expand modeling and simulation capabilities. In 1QFY25, the Army plans to conduct a test series using Gen III VTP backed with ballistic gel to be able to assess potential injuries to soldiers from penetrating threats using modeling and simulation.

Current PPE test methods are limited in the ability to accurately assess soldier injuries. Test mannequins for soft armor vests and hard armor plates do not sufficiently mimic the wearer. The Army developed the Hybrid Foam Mannequin to address these limitations in FY16, but still has not finished the accreditation process. As DOT&E recommended in the FY22 and FY23 Annual Reports, the Army should complete

accreditation of the Hybrid Foam Mannequin.

DOT&E published the hard body armor test protocols for FAT and LAT in 2010. The published protocols are based on hard armor plates that have five sizes, but current Army hard armor plates have eight sizes. DOT&E is in the process of updating the outdated hard body armor test protocols for FAT and LAT to apply to current hard armor plate sizes and adopt the latest test and evaluation best practices. Representatives from the Army, Marine Corps, Navy, U.S. Special Operations Command, and Defense Logistics Agency are participating in the development of the protocol and the review process. DOT&E plans to publish an updated protocol in 3QFY25.

## **PERFORMANCE**

### **» SURVIVABILITY**

One MSV Gen II design was submitted and tested in FY24 and met the ballistic FAT requirements. Three VTP ESAPI designs were submitted and tested for FAT in FY24. Two of the three designs met the ballistic FAT requirements and proceeded to LAT testing. There were no VTP XSAPI Gen III or IHPS Gen II designs submitted for FAT testing in FY24.

The Army conducted over 280 LATs across all SPS systems in FY24. There were approximately 180 LATs for MSV, 90 LATs for VTP, and 20 LATs for IHPS Gen II. All lots passed the Army's threshold requirements except for one VTP

lot. The Army is exploring courses of action to address this failure.

Additional testing is required to assess IHPS Gen II protection compared to legacy helmets and to assess the degree of potential injuries to warfighters from penetrating threats to the IHPS Gen II. The Army has taken steps to address this recommendation from the FY23 Annual Report, and this testing is planned for 2QFY25.

## RECOMMENDATION

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The Army should:

1. Start the accreditation process of the Hybrid Foam Mannequin or develop another accredited soldier surrogate for assessing injuries from penetrating threats to hard and soft body armor.