

Soldier Protection System (SPS)

Executive Summary

- The Soldier Protection System (SPS) consists of four subsystems. Each subsystem has its own acquisition strategy.
 - Torso and Extremity Protection (TEP)
 - Vital Torso Protection (VTP)
 - Integrated Head Protection System (IHPS)
 - Transition Combat Eye Protection (TCEP)
- The SPS TEP, VTP, IHPS, and TCEP met ballistic requirements.
- The Army made a Full-Rate Production decision for the TEP in September 2016 and for the IHPS in October 2018.
- Instead of making a Full-Rate Production decision on the current VTP, the Army plans to test a new, lighter-weight VTP design in 3QFY19.
- The Army will add TCEP to the Authorized Protective Eyeware List (APEL).

System

- The SPS is a suite of personal protection subsystems intended to provide equal or increased levels of protection against small-arms and fragmenting threats compared to existing personal protection equipment and at reduced weights. The SPS subsystems are designed to protect a soldier's head, eyes, and neck region; the vital torso and upper torso areas, as well as the extremities; and the pelvic region. Soldiers can configure the various components to provide different tiers of protection depending on the threat and the mission.
- The SPS consists of four subsystems:
 - VTP consists of front and rear hard armor torso plates, either the Enhanced Small Arms Protective Insert (ESAPI) or the X Threat Small Arms Protective Insert (XSAPI), along with the corresponding hard armor side plates Enhanced Side Ballistic Insert (ESBI) or the X Threat Side Ballistic Insert (XSBI).
 - TEP consists of the soft armor Modular Scalable Vest (MSV) with provision for adding the Ballistic Combat Shirt (BCS) for extremity protection, the Blast Pelvic Protector (BPP) for pelvic and femoral artery protection, and a Ballistic Battle Belt (B3) that provides the capability to redistribute some of the weight burden from the shoulders to the hips.
 - IHPS consists of a helmet with provision for adding a mandible and/or visor, as well as for mounting an applique to the outside of the helmet for additional ballistic protection.
 - TCEP consists of either ballistic spectacles or goggles to protect the soldier's eyes as well as provide the capability to transition from light to dark and dark to light in 1 second or less to enhance the soldier's vision in varying combat conditions.



- The Army plans to issue SPS via Rapid Fielding Initiative to deploying units rather than issue SPS to individual soldiers at each Army installation. The Army is developing plans to determine which soldiers will be individually issued SPS.

Mission

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

Major Contractors

- TEP Full-Rate Production Vendors/Designs (Multiple vendors to stimulate competition and achieve best price through Fair Opportunity awards):
 - KDH Defense Systems Inc. – Eden, North Carolina (MSV, BPP)
 - Bethel Industries Inc. – Jersey City, New Jersey (MSV, BPP)
 - Hawk Protection – Pembroke Pines, Florida (MSV, BPP)
 - Short Bark Industries – Venor, Tennessee (BCS)
 - Carter Enterprises Industries Inc. – Brooklyn, New York (BCS, B3)
 - Eagle Industries Unlimited – Virginia Beach, Virginia (BCS)
- IHPS Vendor:
 - 3M/Ceradyne – Costa Mesa, California
- VTP LRIP Vendors:

FY18 ARMY PROGRAMS

- BAE Systems – Chandler, Arizona (XSAPI, ESBI, XSBI)
- 3M/Ceradyne – Costa Mesa, California (ESAPI)
- TCEP Vendor:
 - Alpha Micron – Kent, Ohio

Activity

- While the SPS consists of four subsystems (TEP, VTP, IHPS, and TCEP), the development, testing, and production/fielding of the four subsystems have been on different timelines. The Army made a Full-Rate Production decision for the TEP in September 2016 and the IHPS in October 2018. Each SPS subsystem is compatible with existing (legacy) personal protective equipment (for example, soldiers can use existing hard armor plates in the new MSV).
- The Army tested TEP, VTP, and IHPS ballistic performance in accordance with DOT&E-approved test plans.
- The Army completed first article VTP testing in September 2017 and additional characterization of VTP performance against additional threats in February 2018. The Army intends to test a new, lighter-weight VTP in 3QFY19 and make a subsequent Full-Rate Production decision on this lighter-weight VTP design.
- The Army completed a series of first article and sub-system-level live fire tests of IHPS in December 2017. This testing began in August 2017 and included: (1) testing of the IHPS against various foreign threats, (2) characterization of the performance of the IHPS against blast threats, and (3) flash heat and fire threat testing to evaluate the IHPS's ability to protect an individual from flash fire induced burns. The Army plans to characterize IHPS against an additional foreign threat when that threat is available.
- The Army conducted first article testing of the TCEP in July 2017. While the lenses met ballistic requirements,

the TCEP did not meet some non-ballistic requirements, so the vendor initiated action to correct the deficiencies. The Army completed TCEP First Article Test (third retest) in February 2018 and will add TCEP to the APEL.

- The Army plans to complete additional full-up system-level testing of the SPS (with all subsystems combined) against additional threats in 4FY19.

Assessment

- The SPS TEP, VTP, IHPS, and TCEP met ballistic requirements for first article testing.
- DOT&E documented the performance of the TEP subsystem in the report to Congress in September 2016, the VTP subsystem in April 2018, and the IHPS subsystem in May 2018.

Recommendations

The Army should:

1. Establish a credible correlation between threat-induced deformations in both the torso plates and combat helmet and the probability of injury.
2. Improve its free-field blast test methodology to enable a credible correlation between the blast pressure mitigation provided by the torso plate and combat helmet and the probability of blast-induced injury.
3. Improve its ability to model fragmenting threats against combat helmets and torso plates.