Soldier Protection System (SPS)

Executive Summary

- The Soldier Protection System (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 consists of the soft armor Torso and Extremity Protection (TEP) subsystem; the hard armor Vital Torso Protection (VTP) subsystem; the Integrated Head Protection System (IHPS) subsystem; and the Transition Combat Eye Protection (TCEP) subsystem. Each SPS subsystem is compatible with existing personal protective equipment. The Army plans to issue SPS to deploying units rather than issue SPS to individual soldiers at each Army installation.
- Each of the four SPS subsystems (TEP, VTP, IHPS, and TCEP) is a separate Program of Record with its own schedule. The Army made a Full-Rate Production decision for the TEP in September 2016, and plans to make Full-Rate Production decisions for VTP and IHPS in 3QFY18.
- The Army resumed first article testing of the Enhanced Small Arms Protective Insert (ESAPI) and the X Threat Small Arms Protective Insert (XSAPI) VTP hard armor plates. The Army began testing the IHPS in August 2017, and is scheduled to complete testing of both the VTP and IHPS in early FY18.

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 ESAPI or the 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 Load Distribution System (LDS) that is integrated within the TEP and provides the capability to redistribute the weight burden from the shoulders to the hips. In response to soldier feedback and an updated requirement, the Army intends to procure a Battle Belt as a stand-alone weight distribution system (WDS) instead of the LDS.

  - 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 initially plans to issue SPS via a Rapid Fielding Initiative (RFI) to deploying units rather than issue SPS to individual soldiers at each Army installation.

Mission

Units with soldiers wearing the SPS will accomplish assigned missions while concurrently protecting themselves 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, LDS)
- Eagle Industries Unlimited – Virginia Beach, Virginia (BCS)
- TBD mid-CY18 (Battle Belt)

- IHPS Vendor:
  - 3M/Ceradyne – Costa Mesa, California
- VTP LRIP Vendors:
  - BAE Systems – Phoenix, Arizona (XSAPI, ESBI, XSBI)
  - 3M/Ceradyne – Costa Mesa, California (ESAPI)

Activity

- The SPS consists of four subsystems (TEP, VTP, IHPS, and TCEP); the development, testing, and production/fielding of the four subsystems are on different timelines. The Army made a Full-Rate Production decision for the TEP in September 2016, and plans to make Full-Rate Production decisions for both VTP and IHPS in April 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 is testing SPS ballistic performance in accordance with DOT&E-approved test plans.
- An LDS was originally a component of the TEP subsystem that addressed a TEP requirement for an integrated WDS. In response to soldier feedback and concerns about the LDS, the Army revised the WDS requirement to that of a stand-alone WDS. The Army intends to use a Battle Belt to meet this requirement and plans Battle Belt contract award in mid-CY18.
- The Army began VTP testing in December 2015 with first article testing of the ESAPI hard armor plates. Shortly thereafter, the Army halted further ESAPI testing because test personnel found deficiencies in the plates while conducting physical characterization of the plates prior to starting ballistic testing. Following a period of corrective action, the vendor resubmitted the ESAPI plates for first article testing, which occurred July through August 2016. Although the ESAPI met ballistic requirements, there were non-ballistic deficiencies for the vendor to correct. While the vendor was addressing these non-ballistic deficiencies, the vendor offered a newer, lighter weight design to the Army. The Army accepted this new design, and began testing it in June 2017. The Army conducted first article testing of the ESBI, XSBI, and XSAPI hard armor plates in May 2016. The XSAPI plate did not meet either the ballistic or the non-ballistic requirements. The vendor completed corrective actions and resubmitted the XSAPI for another first article test, which began in August 2017. The Army will continue VTP testing in FY18.
- The Army began testing of IHPS in August 2017. IHPS testing included:
  - A Limited User Test of the IHPS and TCEP in August 2017 at Joint Base Lewis-McChord, Washington, to assess the effect of the IHPS/TCEP on soldier mobility and subsequent mission effectiveness. DOT&E is analyzing the data from this test.
  - A series of first article and sub-system-level live fire testing of the IHPS began in August 2017 and will continue into FY18. Sub-system-level testing will include testing of the IHPS against various foreign threats. Future testing includes a series of events to characterize the performance of the IHPS when subjected to blast threats, as well as flash heat and fire threat testing to evaluate the IHPS's ability to protect an individual from burns resulting from a flash fire.
- The Army conducted first article testing of the TCEP in July 2017. The TCEP did not meet requirements, so the vendor has initiated corrective action to correct the deficiencies and resubmit the TCEP for first article testing.

Assessment

- DOT&E documented the performance of the TEP subsystem in the report to Congress in September 2016 to support the TEP Full-Rate Production decision.
- The assessment of the VTP and IHPS data is ongoing. DOT&E will report on VTP and IHPS performance upon test completion in FY18.

Recommendations

- Status of Previous Recommendations. The Army addressed the previous recommendation to improve the design of both the LDS and the BCS. The Army still needs to:
  1. Continue to improve its body armor blast testing and analysis procedure.
  2. Use a broader range of fragment simulators to more fully represent the expected threat environment and to then more fully characterize TEP performance.
  3. Quantify the uncertainty associated with its modeling estimates and assess the impact of that uncertainty on the evaluation of TEP performance.
  4. Ensure that all modeling of TEP is accompanied by at least one actual test against a modeled threat to compare modeled TEP performance with actual test results.
- FY17 Recommendations. None.