



# High Energy Laser Target Subsystems Protection



## HEL TSP Capability Summary

- Provides best practices for protecting target subsystems from HEL irradiation
- Includes solutions for target flight termination system, telemetry, and target controller packages
- Employs a systematic solution generation process to help the user select, generate, and evaluate a test subsystems protection solution
- Includes solution guidelines and procedures for applying non-developmental physical protection techniques to the target
- Includes solutions that can be applied to any developmental, operations, or live-fire HEL test that employs an operationally representative target
- Can be requested from the DETEC Website ([www.deteam.org](http://www.deteam.org)) and received via the internet or on CD-ROM
- Developed by SPARTA, Inc. of Huntsville, AL

## HEL TSP Handbook Outline

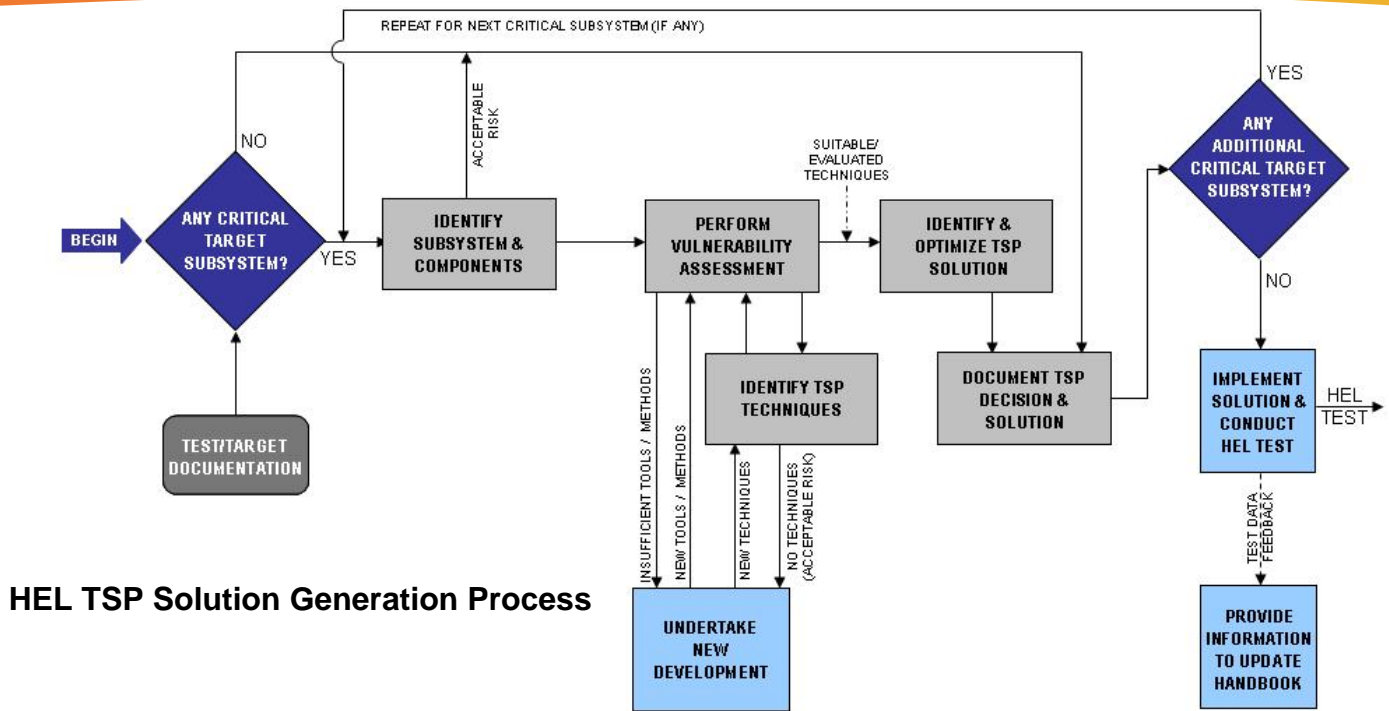
- *Chapter 1: Introduction*—Top level overview of the HEL TSP requirement
- *Chapter 2: HEL TSP Solution Generation Process*—Description of the steps required to select/generate/evaluate an HEL TSP solution
- *Chapter 3: Sanctioned HEL TSP Techniques*—Description of sanctioned TSP techniques, specific application, and validation
- *Chapter 4: Analysis Methods and Tools*—Description of tools and methods used to generate TSP solutions
- *Appendices*

The High Energy Laser (HEL) Target Subsystems Protection (TSP) Capability was developed by the Directed Energy Test and Evaluation Capability (DETEC) project. The HEL TSP Capability is a handbook that provides the best practices for protecting key test target subsystems from HEL irradiation during test events. This capability was developed in response to three high-priority shortfalls identified by the 2004 DETEC Tri-Service Study, which developed, scoped, and prioritized directed energy (DE) test and evaluation (T&E) infrastructure shortfalls. These shortfalls represented a need for a capability to define an approach for protecting target flight termination system, telemetry, and target controller packages installed on targets used in HEL tests.

## HEL TSP Overview

The HEL TSP Handbook describes techniques, analysis methods, and tools that provide a tailored solution for protecting test-specific tactical target subsystems (flight termination system, controller, and telemetry packages) from the effects of an HEL on the rest of the target system and structure. The handbook is structured around a TSP Solution Generation Process - a logical, easy-to-follow, step-by-step process that identifies a tailored subsystem protection solution. This HEL TSP solution may include guidelines and procedures for applying non-physical changes to the test structure (e.g., target engagement geometry changes) and proven non-developmental physical protection techniques for the installed subsystem in the target (e.g., adding redundant components, shielding components, and applying reflective coatings). A common set of techniques is not likely to span all tactical targets that require TSP protection; therefore, the HEL TSP Handbook describes which practices to apply to specific DE targets. Protecting key target subsystems from HEL irradiation ensures range safety and test data integrity.

An HEL TSP solution can be applied to any developmental, operational, or live-fire HEL test that employs an operationally representative target and can include air-to-air, ground-to-air, and ground-to-ground test scenarios. Most test scenarios are anticipated to occur on a test range or facility within the Major Range and Test Facility Base (MRTFB).



**HEL TSP Solution Generation Process**

## Operational Description

Prior to an HEL test, MRTFB analysts, planners, and technicians responsible for preparing test plans and targets for HEL range tests can use the HEL TSP Handbook to determine specific protection techniques that may be applied to a specific target. The resulting test plans will describe test procedures, test scenario characteristics, and target configuration. If any physical changes to the target or key subsystems need to be made, such as applying a unique shielding, the HEL TSP handbook describes the applicable methods and procedures.

## Program Status

The DETEC Systems Integration Contractor (SIC) managed the development of the HEL TSP Capability. The DETEC SIC competitively awarded the HEL TSP Capability development contract to SPARTA, Inc. of Huntsville, AL. SPARTA completed the HEL TSP Handbook in May 2006 and delivered the capability to the Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) in Orlando, FL.

A copy of the For Official Use Only (FOUO) HEL TSP Handbook may be requested by completing the registration process on the DETEC Website ([www.detecteam.org](http://www.detecteam.org)). A user can request his or her preferred distribution method – via the internet or on CD-ROM. A print-friendly version of the handbook is also available.

## HEL TSP Capability Integrated Product Team

To guide the development process, DETEC formed the HEL TSP Capability Integrated Product Team (IPT) with representatives from the MRTFB, the military services, and

the HEL community. The IPT represented the future users of the HEL TSP Capability. The DETEC SIC structured the HEL TSP development to engage IPT members to actively participate in the development effort by providing guidance and expert advice. The HEL TSP IPT members also participated in key reviews at significant points during the handbook development to verify the benefits and completeness of the capability for its intended users.

## About DETEC

DETEC is funded by the Department of Defense Test Resource Management Center's Central Test and Evaluation Investment Program (CTEIP) to address joint service DE weapon system T&E infrastructure needs and implement solutions to these identified needs. DETEC develops and fields capabilities to address the high-priority shortfalls identified in the 2004 CTEIP-funded Tri-Service Study.

The DETEC SIC, Science Applications International Corporation (SAIC), implements the DETEC project by working with Government and industry teammates to develop functional specifications for certain DE T&E infrastructure capabilities. The SIC acquires these capabilities in competitive procurements and integrates the capabilities into the MRTFB to help meet the testing requirements for current and future high energy laser and high power microwave weapon systems. ■

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