The Transportation Security Laboratory (TSL): A Test & Evaluation Perspective

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The mission of the TSL is to apply our scientific and technical acumen to advance explosives and contraband detection technologies for the field.
TSL’s Unique Facilities

- Located at the William J. Hughes Center in Atlantic City, New Jersey
- 12-acre secure campus
- Specialized explosive storage and handling areas
- Extensive inventory of domestic, foreign, and homemade explosives
- Blast-resistant laboratories equipped to evaluate explosives detection equipment
- Multi-laboratory infrastructure designed for applied research, test, and evaluation.
TSL’s Specialized Expertise

- More than 100 employees includes physicists, chemists, engineers, and mathematicians
- A2LA 17025 and ISO 9001 accreditation
- Public-Private Partnerships that expedite transportation security solutions: More than 30 Cooperative Research and Development Agreements (CRADAs) with industry
- Expertise in testing, explosives handling, physics and chemistry of detection, and blast mitigation support HSARPA/EXD and TSA programs.
- Rapid response team capabilities
Terrorist IED fabrication vs. detection is a game of cat and mouse: The threat is changing

- More artful concealment of explosives
- Attempted use of “transparent” explosives
- Changing stream of commerce (e.g. luggage: smaller but with more electronics.)

DHS responds

- Vulnerability analysis of potential threats
- Evolving standards of technical performance
- Spiral R&D programs to address more stringent standards
- Different kinds of detection technologies introduced
- T&E updates with new test articles and T&E protocols that are technology blind
RDT&E for Explosives Detection Solutions

Vulnerability Analysis of new threat

Detection Capability Development
Detection signatures

Technology Development

Equipment Development
Vendor readiness assistance
Detection data Analysis
TSL TOPs program

Equipment T&E
DT&E Vendor readiness testing
IT&E

System Integration

Operational T&E

TSL
Transportation Security Integration Facility (TSIF)
• Commercial Aircraft Vulnerability and Mitigation Program (CAV&M)

• Development and T&E of explosive detection and anomaly detection systems used at checkpoints and for screening of cargo and checked luggage.
  • Developmental Test, Evaluation and Assistance allows industry/academia and others to mature systems so they meet technical requirements that DHS needs
  • Independent Test & Evaluation provides certification/qualification services to validate the ability of explosive detection systems to find concealed explosives supporting the TSA acquisition program

• Supportive applied research to develop test articles and test methods

• Rapid response team capabilities
TSL’s Certification and Qualification Tests

- Defined by PL 101 – 604 in 1990: Recognized as world standard for Explosives Detection Systems (EDSs)
- Formation of Test Director’s Office as independent of R&D: William Petracci, Test Director
- Original EDS certification criteria established in 1992, revised and updated since
- Requires independent evaluation of EDS
- Process defined by EDS certification management test protocols developed by panel of experts: National Academy of Sciences (NAS)
- Test Oversight by independent 3rd party
- Detection: specific types and masses of explosives
- False alarm rate
- Throughput Rate: Automated Rate of Device
- Other requirements: safety, bag/content damage
How TSL helps HSARPA and TSA

- TSL maintains a proven track record of helping explosive detection technologies across “The Valley of Death.”
  - Core understanding of the basic properties of explosive detection technologies
    - Assistance in developing new technologies
  - Developmental Testing
  - Certification / Qualification Testing
  - Support to fielded instruments
    - False alarm analysis
    - Configuration management
    - Test article development for field use
- Rapid Response capability
- Over 80 presently deployed explosive detection systems have been tested at TSL.
TSL/TSIF Testing Responsibilities

**Effectiveness**
- Detection
- Throughput
- False Alarm rates

**Suitability**
- Human systems integration
- Safety
- Alarms, indicators
- Modes of operation
- Privacy
- Data access
- Data storage
- Data transmission
- Systems integration

**Operations**
- Operational throughput
- Availability
- Reliability
- Maintainability
- Survivability
- Personnel Training