System Assessment and Validation for Emergency Responders

SAVER
2014 YEAR IN REVIEW

Homeland Security
Science and Technology

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To meet current national challenges and threats, Federal, state, and local responders need to know the emergency response equipment marketplace in order to select and purchase the equipment that best suits their needs. Although equipment is often tested by manufacturers in a controlled laboratory environment, the overall safety, quality, reliability, and performance of the equipment may be significantly affected in a field environment where its operational performance is of prime importance.

The System Assessment and Validation for Emergency Responders (SAVER) Program was established to assist responders with procurement decisions. Located within the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), the SAVER Program conducts impartial, practitioner-relevant, operationally oriented assessments and validations of commercial off-the-shelf, emergency response equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL). Results, in the form of knowledge products, are then shared with responders, enabling them to better select, procure, use, and maintain emergency response equipment.

SAVER Program knowledge products focus primarily on answering two main questions for the responder community: "What equipment is available?" and "How does it perform?" These

knowledge products are shared nationally with the responder community through the SAVER section of the FirstResponder.gov website.

The SAVER Program is supported by a network of technical agents who conduct assessment and validation activities, coordinate responder participation in the program, and produce SAVER knowledge products. Through its use of technical agents, the SAVER Program is able to research and evaluate an extensive range of emergency response equipment. Between October 2013 and September 2014, technical agents completed 30 projects, assessed 24 products, and produced 59 publications. Brief descriptions of these projects are provided in the subsequent pages of this report.

Technical agents enlist responders to participate in SAVER focus groups and assessments, providing the foundation for the SAVER Program. Through their participation in focus groups, responders assist technical agents in determining information needs and evaluation criteria. Those criteria, which address the overall affordability, capability, deployability, maintainability, and usability of emergency response equipment, are then evaluated by responders during SAVER assessments.

Between October 2013 and September 2014, 62 responders participated in fi e focus groups and four assessments for the SAVER Program. The SAVER Year in Review provides an overview of the SAVER Program and the projects that were completed within the previous year. For more information on the SAVER Program or to view SAVER publications, visit the SAVER section of the FirstResponder.gov website, **www.firstresponder.gov/saver**.

SAVER PROGRAM UPDATE

Previously located on the Responder Knowledge Base (RKB), the SAVER Program website moved to FirstResponder.gov in April 2014. FirstResponder.gov is funded by DHS S&T and provides emergency responders with information on technology, resources, products, programs, standards, testing and evaluation, and best practices.

SAVER content is divided between FirstResponder.gov and First Responder Communities of Practice. Publicly available documents are available on FirstResponder.gov, **www.firstresponder.gov/saver**, while limited distribution documents are available on the Communities of Practice website, **https://communities.firstresponder.gov/saver.**

In order to view limited distribution documents, you will need to request a Communities of Practice account. Prospective members can request an account on the main landing page by clicking on the Request Account icon located below the Sign In box and filling in the request form. All prospective members must provide an eligible sponsor. If you are an emergency responder, you may use a fellow emergency responder or government employee; all other prospective members must provide the name of a government employee as their sponsor.

SAVER PROGRAM PROJECT EXECUTION

SAVER ASSESSMENT PROCESS

The SAVER Program developed an assessment process that guides technical agents through the assessment and validation of commercial off-the-shelf emergency response equipment. The assessment process ensures that the SAVER Program produces relevant and objective information to share with the responder community.

Identifying Information Needs and Equipment Prioritization

To determine what equipment will be assessed, the SAVER Program, on an annual basis, considers Homeland Security Presidential Directives 8 and 5 (HSPD-8 and -5), as well as the information needs of the responder community. After consideration, the SAVER Program, with input from emergency responders, develops a project list for the fiscal year. SAVER projects may include equipment that has never been assessed by the program or equipment that has been assessed but requires an updated evaluation due to technology changes or variances in application for different responder disciplines. DHS S&T, the First Responder Resource Group, and the InterAgency Board then collaboratively discuss and develop an annual prioritization plan for testing and evaluating commercial equipment. After information

needs are identified and the equipment to be assessed is prioritized, DHS tasks the appropriate technical agents.

Project Planning and Execution

Prior to the start of any project, the SAVER Program ensures no actual, potential, or perceived conflict of interest will be encountered by the technical agents or responder participants while executing project tasks, guaranteeing the "honest broker" nature of the SAVER Program. The basic elements of a SAVER project include facilitating a focus group, conducting a market survey, conducting an assessment, analyzing assessment results, and producing SAVER reports. These elements are discribed in the following paragraphs in more detail.

FACILITATE FOCUS GROUP

Focus groups are composed of responders who are familiar with the type of equipment that will be evaluated. One purpose of the focus group is to develop evaluation criteria that will be used for the assessment. Focus group participants also recommend scenarios that may be used during the assessment, identify information needs, and suggest product selection criteria and/or specific products for assessment.

CONDUCT MARKET SURVEY

The purpose of the market survey is to provide information on a particular type of commercial off the shelf, emergency response equipment. The information provided is meant to be useful in determining the types of equipment available for use by responders. The SAVER Program applies due diligence to develop reports that are representative of the marketplace.

CONDUCT ASSESSMENT

Responders participate in SAVER assessments by evaluating a representative

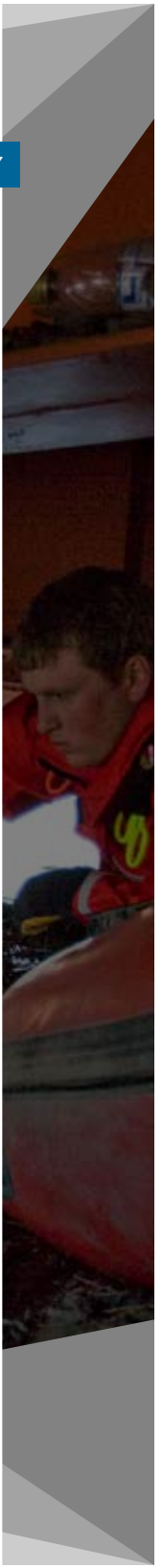
sample of equipment based on evaluation criteria, as identified by a focus group. SAVER assessments include tasks that simulate the actual operational environments of responders. These tasks, which are specific to the equipment being assessed, enable participants to effectively evaluate and rate equipment performance.

ANALYZE ASSESSMENT RESULTS AND PRODUCE SAVER REPORTS

Technical agents use participant feedback to produce SAVER reports. When developing assessment reports, evaluation criteria ratings are used to calculate scores for each piece of equipment. The process used to calculate the score is explained in the final report.

SAVER Review and Approval Process

The SAVER review and approval process is designed to ensure that quality documents reach the emergency responder community. Each SAVER document is routed for review to a variety of subject matter experts both internal and external to the authoring technical agents' organization and is then submitted to DHS for review and approval. Following approval by DHS, the document is posted in the SAVER section of the FirstResponder.gov website, **www.firstresponder.gov/saver.**



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SAVER PRODUCTS

The SAVER Program conducts impartial assessments and validations of commercial off-the-shelf, emergency response equipment and provides the results and other relevant equipment information to the responder community. This information is made available through documents produced by the program and published in the SAVER section of the FirstResponder.gov website, **www.firstresponder.gov/saver.**

Application Note

An application note contains information and recommendations on the operational usage or employment of a specific technology.

Assessment Report

An assessment report provides a comparative evaluation of the selected equipment based on the focus group criteria. It typically reiterates the criteria established in the focus group, provides an overview of the assessment activities, and presents the results. Results are presented as weighted scores, pros and cons, and evaluator comments.

Focus Group Report

A focus group report lists evaluation criteria that fall within the fi e SAVER categories—affordability, capability, deployability, maintainability, and usability—for the purposes of the equipment assessment. The report provides details that responders consider important when making an equipment acquisition or operational decision. A focus group report includes recommended evaluation criteria, assessment scenarios, product selection criteria, and product recommendations.

Handbook and Guide

A handbook summarizes a current technology and describes capabilities and considerations related to that

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technology; operating principles and typical applications are also included. A guide has many of the same features as a handbook; however, the primary focus of a guide is to outline a sample selection, procurement, and/or project management process for a technology.

Highlight

A highlight is a one-page document that provides an overview of a particular SAVER project. The highlight answers the following questions: "What is the project about?" "Who is conducting the project?" and "Why is it important to the responder community?"

Market Survey Report

A market survey report provides a snapshot of the current commercial marketplace for a particular type of equipment. It lists known manufacturers of the equipment, their contact information, and salient technical characteristics of the equipment. For certain markets with a large number of manufacturers, a representative sample of the market may be appropriate. The information is gathered through various means including Internet searches and request-for-information announcements listed on the Federal Business Opportunities website.

Newsletter

A newsletter is produced on a quarterly basis to update the

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PUBLICATIONS

Between October 1, 2013, and September 30, 2014, the SAVER Program produced 59 publications.

- 6 ASSESSMENT REPORTS
- 18 MARKET SURVEY REPORTS
- 14 TECHNOTES
- 5 APPLICATION NOTES
- 5 HANDBOOKS/GUIDES
- 11 OTHER

responder community on the latest information, projects, and activities in the SAVER Program.

Product List
A product list is derived from a market survey report and is typically only produced for very large markets. It is a tabular document that gives very succinct details about products such as the product name, manufacturer, and contact information.

Summary
A summary is typically a four to seven page document that summarizes an assessment report. It presents the evaluation criteria, the most important results, a comparative chart, and conclusions.

Technical Report
A technical report provides details and further analysis of assessed equipment beyond what is typically included in an assessment report.

Technology Guide
A technology guide describes a specific technology and potential applications of that technology, allowing the reader to better understand operational and deployment considerations. Guidelines for selecting and procuring specific technology products are typically provided.

TechNote
A technote is typically a high level, two page document that answers some basic questions about a technology area such as: "What is it?" "What is it used for?" "Who is using it?" "How does it work?" "Why is it important to the responder community?" and "Where can I find more information on this?"

Verification Report
A verification report documents tests on equipment to confirm manufacturer claims; specifically, claims that are of interest to responders when making acquisition or operational decisions.

Year in Review
A year in review provides a description of the SAVER Program and summarizes the projects completed within a fiscal year.

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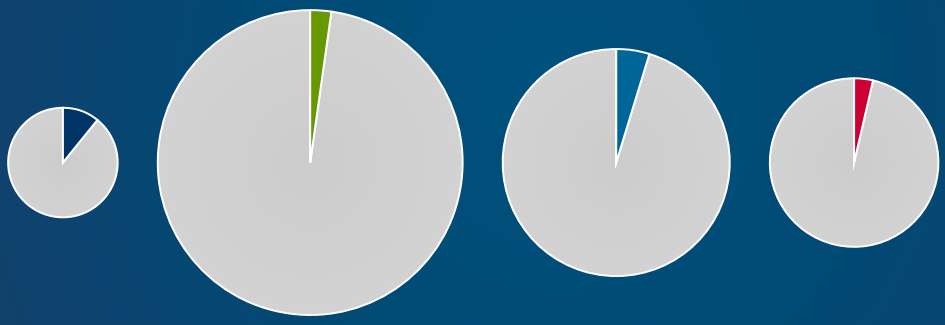
SAVER ACCOMPLISHMENTS



Projects	Participants	Publications	Products Assessed
30*	62*	59*	24*
275†	2,139†	1,181†	651†

* Annual Accomplishments (October 1, 2013, to September 30, 2014)

† Accomplishments to Date (July 1, 2004, to September 30, 2014)

2014 SAVER PROJECTS

Biological Agent Detection Equipment for Field Use by Emergency Responders

07BD-01-KFAS

Biological agent detection equipment designed for use in the field can range from complex systems to simple assays and can vary widely in cost and utility. The field-deployable equipment used by emergency responders is generally point detection technology, and typically falls into two basic categories: immunoassay and polymerase chain reaction (PCR). Most field kits will provide a presumptive positive or negative, with a laboratory providing further analysis to accurately characterize the biological agent.

Biometric Systems

05AU-00-BIOM

Biometric systems measure physical and behavioral characteristics of individuals and assign individuals a unique identity through automated methods. Classified according to the characteristic being measured, these classifications are known as biometric modalities. Law enforcement personnel commonly use fingerprint and facial recognition modalities in order to improve operations such as verifying identities, investigating crime scenes, and maintaining security events, check points, and command posts.

Body-Worn Acoustic Surveillance Systems

13LE-00-SURV

Body-worn acoustic surveillance systems are valuable tools used by law enforcement personnel to gather intelligence and record audio during covert undercover operations. Authenticated audio recorded by these systems may assist with

meeting evidentiary requirements. These systems consist of an audio transmitter with an antenna and a microphone. Some systems have the option to record audio onboard; audio may also be recorded at a listening post.

Cellular Systems, Portable

06CC-01-CELL

The ability to communicate, especially in an emergency situation, is essential for emergency responders; unfortunately, communication systems are susceptible to disruption or loss of service. Portable cellular systems allow emergency responders to establish a cellular network in areas with limited or no cellular service. The portable system acts like a stationary cell tower, providing a cellular communication link to mobile devices within range.

Chemical, Biological, Radiological, Nuclear Self-Contained Breathing Apparatus

01AR-01-SCBA

A Chemical, Biological, Radiological, Nuclear (CBRN) Self-Contained Breathing Apparatus (SCBA) is used by emergency responders entering oxygen-deficient or hazardous environments, when the threat to breathable air is unidentified, of unknown concentration, or determined to be immediately dangerous to life and health. These SCBA are used in conjunction with appropriate personal protective equipment to prevent exposure to CBRN contaminants.

Dosimeters for Response and Recovery

07RD-01-DOSP

Dosimeters are radiation safety devices worn to monitor the personal radiation dose received by an individual from an external source. To ensure safety during response and recovery operations, emergency responders need to know their doses in order to take actions to prevent acute radiation effects and to minimize potential long-term health effects.

Encryption Software Tools

05EN-00-ECRP

Emergency responders often store sensitive information on portable computers and handheld devices, and transmit sensitive information through e-mail, instant

messaging, and other forms of digital communications. Encryption software tools prevent this information from being disclosed when a computing device is lost or stolen or when a message is intercepted by a third party.

Explosive Protection

02EX-02-TLEX

Explosive devices cause blast overpressure, fragmentation, and thermal damage. Accordingly, emergency responders need equipment that protects vital organs, does not restrict movement, is synergistic with job function, and does not require extensive maintenance or training. Explosive protection may consist of personal protective equipment, emplaced mitigating equipment, and emerging explosive protection technologies.

Extrication Devices

09ME-05-LITR

Emergency responders use extrication devices to remove and transport casualties from the scene of an emergency. These devices are available in various sizes, shapes, and configurations, and can be grouped into four different types, which differ in the way the patient is removed from the incident scene and transported into an ambulance. The majority of extrication devices are carry-type; the others include litter-, drag-, and roll-type devices.

Flame Ionization Detectors, Portable

07CD-01-DPFI

Portable flame ionization detectors (FIDs) are used by emergency responders to detect the presence of organic species, including hydrocarbons and volatile organic compounds. These substances may be toxic or form flammable or explosive mixtures with the air, so it is important for responders to be aware of their presence. Portable FIDs are designed for field use, relatively rugged, simple to operate, inexpensive to purchase, and can measure many hydrocarbons over a wide variety of concentration ranges.

Forensic Light Kits, Portable

20CS-02-UVLT

Portable forensic light kits are used by law enforcement personnel to detect and analyze evidence found during crime

scene investigations. These kits typically include at least one alternate light source (ALS), barrier filter, power source, and carrying case. The ALS emits ultraviolet, visible, or infrared light that is filtered to individual wavelengths, enhancing the visualization of evidence, which may fluoresce or darken when illuminated and viewed through the corresponding filter. Different wavelengths enhance the appearance of different types of evidence.

GPS Blue Force Tracking Systems

04AP-02-OAPT

'Blue force tracking' is a term coined by the U.S. military that refers to monitoring the location of friendly forces' personnel and resources, including civilian emergency responders, in a particular area. These systems use Global Positioning System (GPS) satellites; however, tracking inside GPS-denied areas is challenging. Accurate blue force tracking in GPS-denied areas is an emerging technology that can be used to locate personnel in multi-story structures, underground, or in tunnels. Real-time location information can then be leveraged to provide dynamic situational awareness.

Improvised Explosive Device Personal Protective Equipment

02PE-01-BSUT

Personal protective equipment (PPE) is used by emergency responders and bomb technicians when an improvised explosive device (IED) or other potentially life-threatening explosive is confirmed or suspected to be present. Also known as a bomb suit, IED PPE consists of body armor designed to withstand the pressure released following an explosion as well as debris that is produced. Modern bomb suits includelayers of penetration-resistant materials, ballistic plating, and foam, placed strategically to provide maximum protection.

IPAWS Compliant Common Alerting Protocol Alert Origination Tools

04AP-09-ALRT

The Integrated Public Alert and Warning System (IPAWS) is the latest system to enable the President of the United States to warn the American public of emergencies and disasters. The primary objective of IPAWS is to modernize and integrate

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existing alert and warning systems at the national, state, territorial, local, and tribal levels into a single, cohesive interface. The system provides a means to alert citizens through multiple communication methods simultaneously, increasing the likelihood that the message will successfully reach the public.

LTE

04SN-01-XMIT

Long term evolution (LTE) cellular services are the most technically up-to-date, commercially available wireless communication systems. Also marketed as 4G, or fourth generation, this broadband wireless technology service features advanced signal encoding and transmission techniques that enable a significant improvement in high-speed data communication. Among the improvements are enhanced security for data transfer and very low latency, which minimizes the delay when transmitting information.

Night Vision Technologies

03OE-02-TILA | 04MD-01-LAMP

Night vision devices enhance vision in environmental conditions with little or

no light, and are used by emergency response agencies to extend operational capabilities in nighttime or low-light scenarios by enabling the user to detect and recognize objects and identify distinguishing features. Night vision technology includes image intensifier devices, thermal imaging cameras, integrated night vision systems, and near infrared illuminator technology.

Passive Millimeter Wave Detectors
15SC-00-PPSS

Passive millimeter wave detectors are used to screen people for concealed weapons and contraband. Unlike X-ray and metal detection, these detectors can identify suspect items without emitting electromagnetic waves, and provide law enforcement and security personnel a safe and effective means of detecting and distinguishing among a variety of materials including metals, ceramics, plastics, liquids, gels, and powders.

Radiation Detectors, Personal
07RD-01-HHSM

Personal radiation detectors are small electronic devices used to detect the illicit transport of radioactive materials. They are designed to be worn by law enforcement personnel or customs inspectors to provide an indication of elevated radiation levels. Also known as radiation pagers, they may be used for screening during patrols or at events.

Radiation Portal Monitors, Portable
15SC-00-PMON

Portable radiation portal monitors are used by police, security, and emergency response personnel to screen persons and objects for the presence of radioactive materials. The main application for these devices is monitoring large numbers of citizens for contamination after a radiological or nuclear incident. They may also be used to screen persons entering or leaving a sensitive area. These devices may detect gamma, beta, and neutron radiation, depending upon the application.

Radiation Survey Meters, Handheld
07RD-01-HHSM

Handheld radiation survey meters are portable instruments used where radioactivity is suspected or known to be present in order to locate the source or to assess the radiation

intensity. These devices might be used to screen a suspicious package or to confirm radiation detected by another type of instrument, determine the nature and extent of radioactive contamination, delineate radiation protection zones, or scan people for contamination. They may be capable of measuring different types of radiation, such as gamma, beta, and alpha.

Radionuclide Identification Devices

07RD-01-RIID

When radioactive materials are detected, emergency responders use handheld radionuclide identification devices to identify the specific radionuclides present. These devices can distinguish between nonthreatening radioactive materials, such as industrial or medical radionuclides, and high-level threats, such as radiological dispersion devices or improvised nuclear devices. By identifying the specific radionuclides present, emergency responders can determine how to minimize the impact of an event.

RFID In-Vehicle Inventory Systems

04HW-02-RFID

Emergency response vehicles contain an extensive inventory of gear such as medical supplies, uniforms, firearms, and firefighting and life-support equipment. The manual inventory process for emergency vehicles is time consuming and can be inaccurate due to lost or damaged paperwork, miscounted items, or illegible handwriting. Radio Frequency Identification (RFID) in-vehicle inventory systems streamline and automate the inventory process by decreasing overall processing time and increasing efficiency and accuracy.

Small Package X-ray Systems

15SC-00-PPSS

Small package X-ray systems are used to screen small luggage, briefcases, purses, outerwear, and other bags and packages for weapons, explosives, or other contraband. They are used in schools, government facilities, transportation venues, and at other building and event

checkpoints. These systems are typically one component of a layered security structure that may also include operational procedures, security personnel, physical barriers, personnel screening equipment, and/or surveillance equipment.

Small Platform Tactical Robots

03OE-07-ROBT

Small platform tactical robots are typically used for information gathering when deployed to potentially hazardous incidents. Their use allows law enforcement personnel to maintain a safe distance and still obtain valuable data, such as video and audio. Small platform tactical robots may also facilitate communication between law enforcement personnel in a command post and those at the center of the incident.

Social Media for Emergency Responders

04AP-09-ALRT

Social media are web-based networks that allow users to communicate and interact with family, friends, colleagues, community groups, and government organizations for the purpose of sharing information and multimedia content. Use of these communications tools has been on the rise within the emergency responder community over the past several years. The benefits range from an ongoing dialog with the public that can aid in more cooperation and resiliency during actual emergencies to crime solving based on input from eye witnesses in the community.

Structural Firefighting Gloves

01SF-01-GLOV

Firefighters require hand protection while fighting structural fires but also need to be able to perform manual tasks that require dexterity, tactility, and grip. Structural firefighting gloves provide protection against numerous hazards including high heat, flame, some hazardous liquids, cuts, punctures, and abrasions, while allowing for manual dexterity, comfortable fit, and durability.

Surveillance Kits, Portable

14SW-01-ALRM

Portable surveillance kits are used by law

enforcement personnel and public safety officials for airport and/or event security, incident response, and during covert operations. Portable surveillance kits can be used in situations where cabled camera systems are not available due to construction or environmental barriers, cost, and/or time constraints.

Total Containment Vessels

02EX-00-TCVV

Total containment vessels are fully enclosed containers designed to safely secure, transport, and test explosive or chemical devices. These vessels are used by emergency responders to help protect people, property, and the environment from primary and secondary fragmentation and gases that generally result from the detonation of an explosive device. Once the suspect object is contained in the chamber, the surrounding area is protected from blast effects of the explosive device.

Walk-Through Metal Detectors

15SC-00-PPSS

Walk-through metal detectors, also called portal or personnel screening metal detectors, are devices used to screen individuals for weapons or other concealed contraband. They are used for security at checkpoints in airports, government facilities, entertainment and transportation venues, and other buildings.

Wildland Firefi hter Personal Protective Equipment

01LE-02-BDUS

Prior to the introduction of high performance flame resistant fabrics, most wildland firefighters wore basic work clothing during wildfire operations; however, wildland firefighter personal protective equipment material performance has evolved significantly over time. Since the 1960s, advances in flame resistant fabrics greatly improved the level of radiant heat protection and flame resistance of wildland firefighter personal protective equipment.