



Homeland Security
Science and Technology

Newsletter

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System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions. Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts assessments and validations on commercially available equipment and systems, and develops knowledge products that provide relevant equipment information to the emergency responder community.

SAVER Program knowledge products provide information on equipment that falls under the categories listed in the DHS Authorized Equipment List (AEL), focusing primarily on two main questions for the emergency responder community: “What equipment is available?” and “How does it perform?” These knowledge products are shared nationally with the responder community, providing a life- and cost-saving asset to DHS, as well as to Federal, state, and local responders.

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. This newsletter highlights some of the projects that technical agents have recently completed and the knowledge products they have produced.

For more information on the SAVER Program, contact the SAVER Program Support Office.
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Handheld Image Intensifiers

Handheld image intensifiers increase the intensity of available light to provide imaging in poorly lit situations.

They are widely used by

responders in nighttime surveillance, search and rescue, and covert operations.

These devices may assist with navigation of terrain in darkness and recognition of objects and people that may not be seen by the unaided eye. In March 2014, the Space and Naval Warfare Systems Center (SPAWARSYSCEN) Atlantic conducted an assessment of handheld image intensifiers for the System Assessment and Validation for Emergency Responders (SAVER) Program. The assessment was based on recommendations of a focus group that met in April 2013.

The focus group recommended eighteen evaluation criteria grouped within five SAVER categories. These criteria and their definitions can be found in the *Handheld Image Intensifiers Focus Group Report*. The focus group also made recommendations regarding assessment scenarios and product selection.

During the assessment, six handheld image intensifiers were assessed in two phases—the specification assessment and the operational assessment. Evaluators assessed each device based on vendor-provided information and specifications during the specification assessment. Prior to the operational assessment, evaluators familiarized themselves with the proper use, capabilities, and features of each device. During the operational assessment, evaluators assessed each device based on their hands-on experience using the products in four scenarios: setup, search and rescue, surveillance, and bright light.

The setup scenario allowed evaluators to—among other things—review the user manual for each device, as well as install the battery, perform recommended cleaning and maintenance procedures, inspect durability while manipulating the controls, observe infrared (IR) illumination, and observe a facilitator using each device.



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During the surveillance scenario, evaluators used each device with the IR illuminator switched off to monitor individuals outdoors at nighttime from varying distances, and attempted to identify objects in the individuals' possession. Evaluators then followed an individual into a building and used each device to navigate hallways and open doors; when instructed, evaluators switched on the IR illuminator and navigated a flight of stairs.

The search and rescue scenario involved evaluators using each device outdoors with the IR illuminator switched off to locate an individual at a disclosed location. As evaluators approached the individual, adjustments were made to the gain and focus of each device as needed. Evaluators then assessed the field of view by observing a 65-foot long row of cones from a distance of 20 yards.

Tube protection was assessed during the bright light scenario. Evaluators used each device to observe a darkened room in which a light was turned on momentarily, and also to scan from a darkened room to an area where bright light was present.

As evaluators completed the assessment scenarios, they were given the opportunity to rate each device based on its performance. Evaluators reviewed the ratings and comments for all of the devices at the conclusion of the assessment. The assessment results can be found in the *Handheld Image Intensifiers Assessment Report*.

In addition to the assessment, SPAWARSYSCEN Atlantic also conducted market research to provide responders with information on these devices, which can be found in the *Handheld Image Intensifiers Market Survey Report*.

Environmental (Weather) Surveillance Systems

Weather conditions such as heavy rain, flooding, high winds, low visibility, or temperature extremes can affect emergency response operations. Responders also need to consider the effect of these conditions on roads in order to determine safe routes to incident sites.

Environmental (weather) surveillance equipment is used to measure weather conditions at and around incident sites; this is particularly important for incidents involving the release of hazardous materials into the atmosphere in or near population centers. Weather stations provide users with information about wind speed and direction,

temperature, relative humidity, barometric pressure, and precipitation. Knowledge of weather conditions is needed to assess risks, establish exclusion zones, protect downwind areas, position incident command posts, and develop plans of action.

Fixed weather stations may be located some distance away from an incident site, but the weather information obtained may still be useful. If there are no fixed weather stations near the incident site, portable and vehicle-mounted weather stations can be used. Weather data from all available equipment—fixed, portable, and vehicle-mounted—both near an incident site and in surrounding areas can be used as well as that from local, regional, or national weather forecasting services.

The National Urban Security Technology Laboratory (NUSTL) conducted a market survey of commercially available environmental (weather) surveillance systems in order to provide responders with information that would be helpful in making a purchasing decision. Results of this survey are published in the *Environmental (Weather) Surveillance Equipment Market Survey Report*.

Biometric Systems

Biometrics measure the physical and behavioral characteristics of individuals and assign a unique identity through automated methods. Physical characteristics include the anatomical components and physiological functioning of the human body, while behavioral characteristics describe the way an individual reacts or moves within the environment.

Emergency response agencies are rapidly implementing biometric systems to improve operations such as verifying inmate identities, investigating crime scenes, and maintaining security at sporting events and incident command posts. Rapid identification using biometric systems provides many benefits, including enhanced safety for emergency responders, a safer community, and increased security of the nation's borders.



*Weatherpack EOC.
Photo courtesy of Coastal
Environmental Systems Inc.*



Facial Features. Image courtesy of SAVER Program.

Biometric systems provide reliable verification and identification capabilities to responder agencies. These systems capture and match physiological, anatomical, and behavioral characteristics that are distinctive and unique to each individual. Fingerprint, face, iris, and DNA are the most common modalities in use in law enforcement. Many other modalities are in use as well, while others are still under research and development.

Biometric systems are technologically complex, but there are five primary processes supported by the sensors, software, and computers that make up these systems; they are capture, conversion, storage, comparison, and decision. Biometric databases house the biometric data, or biometric references, against which biometric samples are compared.

SPAWARSYSCEN Atlantic produced the *Biometric Systems Application Note* to provide responders with information on biometrics technology, standards and specifications, and databases, as well as discussions of current applications of the technology. The application note is meant to assist those seeking to implement this type of technology.

Recent SAVER TechNotes

The SAVER Program produces several types of documents to disseminate information to the emergency

responder community. One such document, the technote, provides responders with a high-level introduction to a technology area by answering basic questions about the technology 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?”

As a technical agent, NUSTL recently completed several technotes for the SAVER Program. These technotes are described in the following paragraphs.

CBRN Air-Purifying Escape Respirators

Air-purifying escape respirators (APERs) are worn for protection from breathing harmful gases during an emergency evacuation. Chemical, biological, radiological, nuclear (CBRN) APERs are a special class of APER designed to block chemical and biological agents and radioactive dust particles.

CBRN Self-Contained Breathing Apparatus

CBRN self-contained breathing apparatus (SCBAs) are used by responders entering an oxygen-deficient or extremely hazardous environment, or when the threat to breathable air is unidentified, of unknown concentration, or determined to be immediately dangerous to life and health.

SCBA, Full-Facepiece, Closed-Circuit

Full-facepiece, closed-circuit SCBAs are designed to protect personnel in hazardous, toxic, or oxygen-deficient environments. Closed-circuit SCBAs recirculate breathing air and purify it, removing carbon dioxide and adding fresh oxygen.

The publications listed in the Spring 2015 Newsletter can be found in the SAVER section of the FirstResponder.gov website, www.FirstResponder.gov/SAVER. These publications are available to the responder community.



(Left to right) CBRN Air-Purifying Escape Respirators; CBRN Self-Contained Breathing Apparatus; and SCBA, Full-Facepiece, Closed-Circuit TechNotes.