



**Homeland
Security**

Science and Technology

Summary

U.S. Department of Homeland Security



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 objective operational tests on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

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Operational Vests

In order to provide emergency responders with information on currently available operational vest capabilities, limitations, and usability, Science Applications International Corporation (SAIC) conducted a comparative assessment of operational vests for the SAVER Program in August 2008. Detailed findings are provided in the Assessment Report on Operational Vests, which is available by request at <https://www.rkb.us/saver>.

Background

Operational vests are typically worn by emergency responders to carry supplies and necessary equipment. Some manufacturers offer operational vests that can be customized for mission-specific tasks. For example, concealment vests are available for law enforcement personnel during undercover operations. Flotation vests are designed for response personnel who may be required to conduct water rescue tasks. Other operational vests, which are specifically designed for health care practitioners, have numerous pockets to facilitate the transportation of medical supplies.

Operational vests are available in various configurations to aid in the organization of equipment and to promote response flexibility. These vests offer attachments and compartments such as pockets, pouches, tabs, and loops. They provide closure options such as buckles, zippers, and hook and loop devices. In addition, optional features such as drag handles, shoulder pads, and integrated holsters are also available.

Assessment

A focus group of eight emergency response practitioners from various regions of the country met in December 2007 to identify equipment selection criteria, evaluation criteria, and assessment scenarios. Focus group–recommended selection criteria included tactical vests with holsters, flotation capabilities, integrated ballistic capabilities, or medical vests. Based on focus group recommendations and market survey research, SAIC selected the following four vests for assessment:

- Phenix Gear™, Phenix Gear Modular Vest
- Leapers, Inc., Deluxe Tactical Vest with Quick Draw Holster
- Blackhawk Product Group, Tactical Float Vest II
- Blackhawk Product Group, Omega Tactical Vest-Medic/Utility-Mesh Vest.

Eight emergency response practitioners were selected to serve as assessment evaluators. Each operational vest was worn during simulated raids which required evaluators to search potential areas where bombs were reportedly assembled, stored, or planted for detonation. Evaluators conducted four rotations, and a different operational vest was assigned for each rotation. Evaluators were also provided simulated M-4 rifles, shotguns, and handguns (i.e., red guns) for evaluation purposes.

Four scenarios were encountered during each rotation. The first station required evaluators to conduct a vehicle search while wearing the operational vests along with their routine response equipment. The second station tasked evaluators to clear suspect(s) from a train car and to identify and report the location of an improvised explosive device (IED). The third station involved two separate activities. Evaluators were first required to crawl through a darkened maze, and then they were required to breach a steel-reinforced door using a battering ram. The fourth station required evaluators to conduct clearance operations of a multilevel building where they were tasked with climbing exterior ladders, hoisting equipment, and pulling a mannequin from the building.

A separate area was staged to allow evaluators an opportunity to wash the vests. Upon completion of the individual rotations, each team was permitted to wash the vests with soap and water.

Assessment Results

Evaluators rated the operational vests based on the evaluation criteria established by the focus group. Each recommended criterion was assigned to one of the five SAVER categories, and each SAVER category was assigned a weighting factor to indicate its impact on the total composite score. The SAVER category and composite scores are shown in table 1. Higher scores indicate better equipment performance. To view how each vest scored against each of the evaluation criteria assigned to the SAVER Program categories, see table 2 (on page 6).

The following paragraphs provide a brief summary of the evaluator comments and feedback on each operational vest and present the vests from the highest

SAVER Program Category Definitions

Affordability: This category groups criteria related to life-cycle costs of a piece of equipment or system.

Capability: This category groups criteria related to the power, capacity, or features available for a piece of equipment or system to perform or assist the responder in performing one or more responder-relevant tasks.

Deployability: This category groups criteria related to the movement, installation, or implementation of a piece of equipment or system by responders at the site of its intended use.

Maintainability: This category groups criteria related to the maintenance and restoration of a piece of equipment or system to operational conditions by responders.

Usability: This category groups criteria related to the quality of the responders' experience with the operational employment of a piece of equipment or system. This includes the relative ease of use, efficiency, and overall satisfaction of the responders with the equipment or system.

to lowest composite score. For the purposes of this SAVER Summary, the category scores are normalized and rounded to the nearest whole number. The complete assessment report includes a breakdown of evaluator comments by individual criterion.

Phenix Gear Modular Vest


The Phenix received the highest composite scores in three of the SAVER Program categories: capability, deployability, and maintainability. Evaluators reported that the vest is compatible with modular lightweight load carrying equipment (MOLLE), and it features the Pouch Attachment Ladder System (PALS) to secure its modular components. Evaluators stated

Table 1. Operational Vests Assessment Results¹

Operational Vest	Composite Score	Affordability (15% Weighting)	Capability (30% Weighting)	Deployability (15% Weighting)	Maintainability (10% Weighting)	Usability (30% Weighting)
Phenix	72	69	76	76	63	72
Deluxe	69	70	65	75	50	78
Tactical Float	63	54	64	69	49	67
Omega	61	50	54	72	53	72

Note:

¹ Scores contained in the assessment report may be displayed differently. For the purposes of the SAVER Summary, all SAVER category scores are normalized using a 100-point scale and rounded to the nearest whole number.

	<p>↑ Pros</p> <ul style="list-style-type: none"> Adjustable shoulder straps MOLLE/PALS compatible Price Cleaning and care instructions
	<p>↓ Cons</p> <ul style="list-style-type: none"> Zipper Poor ventilation; hot Movement restrictions Heavy Absorbs water Rides up if vest is not secured to belt Not available in black Size; adjustment capabilities
Phenix Gear Modular Vest	Composite Assessment Score: 72

the numerous pouches range in a variety of sizes and can be easily removed and repositioned based on personal preferences or needs.

They stated that the Phenix is designed with a pull strap that allows the user to easily conduct emergency retrievals. Evaluators reported that the vest can accommodate a hydration system, provides dual padded rifle shoulder pads to absorb weapon recoil, and includes a radio pouch. They stated that the closure devices are easily operated, and the design of the vest allows ease of access to the equipment below the user's belt line. Evaluators stated that the shoulder panels are adjustable and allow the user to modify the length of the vest. This feature also allows the user to quickly doff the vest in emergency situations. In addition, evaluators noted that the Phenix can be worn over a ballistic vest or multiple layers of clothing. They agreed that the current configuration of the Phenix appears better suited for military uses; however, they agreed that it can be used by multiple disciplines (e.g., police, fire, and rescue). Evaluators also stated that the vest can be easily transitioned from one task to another.

Evaluators agreed that the vest is reasonably priced, especially considering the modular components included with the initial cost. They stated the vest includes a limited lifetime warranty, and the manufacturer provides care instructions for cleaning the vest, as well as a detailed list of hazardous solutions to avoid. Evaluators reported the vest can be easily cleaned with soap and water, and it appears to be capable of withstanding repetitive cleanings.


Evaluators reported that the Phenix is available in only one size, and it is difficult for the user to adjust once it has been donned. They also agreed that it should be

more form-fitting to provide a more comfortable wear. In addition, the vest is not available in dark blue or black. Evaluators stated that the vest has the tendency to ride up if the belt keepers are not used to secure it to the user's belt. They explained that the nylon material is heavier than the other assessed vests, and it provides poor ventilation when worn.

Deluxe Tactical Vest

The Deluxe received the highest composite scores in the SAVER usability and affordability categories. Evaluators stated the vest is fully adjustable and can be adapted for different body builds. The quick-release side straps allow the vest to be easily adjusted, and the zipper is easy to operate while wearing gloves. The vest is compatible with ballistic vests or other body armor, and it can be worn over multiple layers of clothing. Evaluators agreed that the Deluxe can be easily donned and doffed without assistance and it provides a snug fit and comfortable wear.

Evaluators explained that the lightweight vest is well balanced, the pockets are adequately sized for equipment, and its mesh fabric allows adequate ventilation. They reported that the integral belt can accommodate a drop holster, and the vest design allows easy access to the user's belt. There were no restrictions encountered while climbing, crawling, or bending, and the vest remained stationary even when the belt keepers were not used.

	<p>↑ Pros</p> <ul style="list-style-type: none"> Comfortable; lightweight No movement restrictions Good ventilation Roomy pockets Width adjustment Modular holster Easily donned/doffed Price Color selections Integral belt Easy to clean; dries quickly
	<p>↓ Cons</p> <ul style="list-style-type: none"> Poorly constructed rescue pull handle Fastener on holster requires two hands for retrieval of weapon No place for shoulder microphone Not modular Uncomfortable side pockets Rides up if vest is not secured to belt Vague warranty information
Deluxe	Composite Assessment Score: 69

Evaluators noted that the Deluxe is reasonably priced and available in an assortment of color choices. It can also be ordered in a left-handed configuration. They were unable to locate manufacturer care instructions but stated that the vest can be easily cleaned with soap and water. In addition, it appears to be capable of withstanding repetitive cleanings.

Evaluators stated that the pouches and components on this vest are stationary and cannot be removed. They noted that the holster is the only modular component on the vest, and two hands are required to retrieve a weapon from the holster. The vest features an emergency pull strap, but evaluators expressed that the strap is poorly constructed and can easily fail under stress. They also noted that the side pouches are difficult to access.

Tactical Float Vest II

Evaluators stated that the zipper of the Tactical Float Vest adequately secures the front opening of the vest, even when worn with a ballistic vest or multiple layers of clothing. They noted that the vest features a large, sturdy pull strap for retrieval purposes, a hook and loop panel for identification patches, and durable fasteners that are capable of withstanding repetitive use. The vest also features an emergency cut away shoulder strap system, shoulder D-rings for accessory attachment, and a padded sniper pad to shoulder a weapon. Evaluators reported that the vest can be easily donned, adjusted, and doffed without requiring assistance from another responder. They stated that




the Tactical Float is available in black, which is a preferred color for law enforcement practitioners. They also agreed that the Tactical Float is easy to clean with soap and water, and it appears capable of withstanding repetitive cleanings.




Evaluators reported that the Tactical Float is constructed with U.S. Coast Guard approved foam, but it is not a Coast Guard-approved personal flotation device (PFD). They noted that the vest does not include modular components, and the pouches cannot be interchanged or repositioned. Evaluators stated that the thick foam pad actually prevents the user from being able to shoulder a firearm, and it hinders the vest’s compatibility with other equipment. They noted that the vest does not feature a duty holster, and they recommended that the Tactical Float not be used as a multi-operational vest to transition from one task to another. Evaluators noted that the vest does not accommodate individuals with short torsos, and it does not provide a comfortable wear while conducting response operations. They stated the vest design is excessively bulky and difficult to maneuver in while conducting tasks. Evaluators explained that the pouches are not proportionately placed on the vest (which affects the weight distribution of the equipment), and the straps tend to loosen while the user is bending, crawling, or climbing. In addition, the straps are uncomfortable when worn as intended across the groin area.

Evaluators noted that the initial cost is expensive which may preclude jurisdictions from purchasing the vest. They reported that the manufacturer’s warranty is vague, and no cleaning instructions are provided with the vest.

Omega Tactical Vest

The Omega features an emergency cut away shoulder strap system and a pull strap that can accommodate a two-hand drag. The vest also features a large pouch for a hydration reservoir, a D-ring for accessory attachment, and a hook and loop strip for an identification patch. Evaluators noted that the black vest includes adjustable lace side straps which help the vest conform to user’s body. They noted that the Omega provides a snug fit, and it can be easily donned and doffed without assistance. The vest can be comfortably worn over a ballistic vest or multiple layers of clothes, and its mesh fabric allows adequate ventilation while performing tasks. Evaluators agreed that the vest is thin and lightweight, and they experienced no interferences or restrictions while

	 Pros	<ul style="list-style-type: none"> • Comfortable; lightweight • No movement restrictions • Good ventilation • Roomy pockets • Width adjustment • Modular holster • Easily donned/doffed • Price • Color selections • Integral belt • Easy to clean; dries quickly
	 Cons	<ul style="list-style-type: none"> • Poorly constructed rescue pull handle • Fastener on holster requires two hands for retrieval of weapon • No place for shoulder microphone • Not modular • Uncomfortable side pockets • Rides up if vest is not secured to belt • Vague warranty information
Tactical Float		Composite Assessment Score: 63

	 Pros <ul style="list-style-type: none"> • Lightweight • Oriented towards emergency medical services (EMS) • Easy to clean • Repels water
	 Cons <ul style="list-style-type: none"> • Too long; interferes with duty holster • Poor adjustment capabilities • Price • Not modular • Poor pocket closures • Vague warranty information • Cannot shoulder weapon
Omega Tactical Vest	Composite Assessment Score: 61

- Evaluators felt that operational vests should feature modular components to allow customization by different disciplines.
- Evaluators stated darker colors would allow the user to remain concealed or obscured during covert operations, and the vests should be capable of being donned/doffed without assistance.
- Evaluators agreed that the vests should provide adequate ventilation to prevent the user from becoming overheated.
- Evaluators concluded that the operational vests should be easy to clean and maintain for repetitive use and storage.

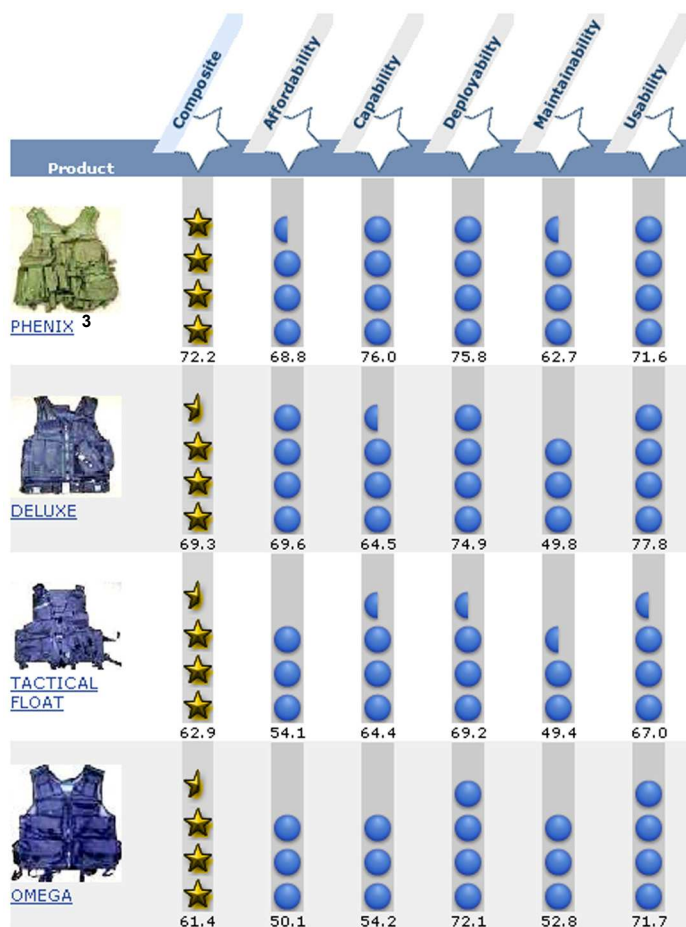
moving, climbing, or crawling. In addition, evaluators stated that the vest can be easily cleaned with soap and water, and it appears durable enough to withstand repetitive cleanings.

Evaluators reported several disadvantages with the Omega. They stated that the Omega vest does not feature modular components, and its stationary pouches do not permit customization. They noted that the vest appears more appropriate for medical practitioners rather than law enforcement personnel. Evaluators explained that the vest does not include pouches for magazines or communications equipment, and it is not compatible with a duty holster. They stated that the hook and loop does not secure items within the pockets, and there was expressed concern that the pocket design would allow contents to fall out while performing response tasks. In addition, the pocket configuration also prevents the user from being able to shoulder a weapon. Evaluators agreed that the vest is overpriced since it cannot be customized and offers limited storage options. Evaluators stated the warranty information is vague, and they were unable to locate cleaning instructions for the vest.

Conclusion

Emergency response practitioners from across the nation successfully evaluated four operational vests. The Phenix Gear Modular Vest by Phenix Gear scored the highest, followed by the Deluxe Tactical by Leapers, Inc. The Tactical Float Vest II by Blackhawk Product Group received the third highest score, and the Omega Tactical Vest by Blackhawk Product Group received the lowest score.

QuickLook Snapshot²





































































Notes:

² The SAVER QuickLook, available on the SAVER Web site, allows users to select the SAVER categories that are most important to their department and view results according to their specific needs.

³ Scores contained in the assessment report may be displayed differently. For purposes of the QuickLook, all SAVER category scores are normalized using a 100-point scale.

For additional information on the assessment and to access other reports in the series, visit the SAVER Web site <https://www.rkb.us/saver>.

Table 2. SAVER Category and Criteria Scores

KEY					
Least Favorable		Most Favorable			
					
		Phenix	Deluxe	Tactical Float	Omega
Affordability					
Initial cost					
Replacement/repair cost					
Accessories					
Capability					
Compatibility with other equipment					
Pocket configurations					
Fabric durability					
Protection					
Identification					
Deployability					
Donning/doffing					
Staging					
Maintainability					
Cleaning requirements					
Material degradation					
Spare parts					
Usability					
Functionality					
Comfort		