



Photo courtesy of Steve Vandewalle, SDFRD

NEWSLETTER

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This Newsletter discusses technologies of interest to first responders that have received funding, in part, from the Federal government. Mention of these technologies should not be construed as an endorsement of either the technology, or the entity producing it, by the Federal government.

To download a copy of this newsletter, visit:
<http://www.firstresponder.gov/Pages/NewsLetterPage.aspx?NewsLetter=current>

NO MORE FLYING BLIND

Helicopter is Equipped with Night-Flying Capability



Photo courtesy of Steve Vandewalle, SDFRD

Aerial firefighting at night can be very dangerous and quite costly. Pilots must fly at low altitudes to dump water on a fire, putting their aircraft in danger of colliding with objects that cannot be seen in the dark, such as power lines. Moreover, nighttime aerial firefighting requires a great deal of training. However, the benefits of night-flying far outweigh the risks and costs for some California fire departments.

The San Diego Fire-Rescue Department (SDFRD) is one of only three fire departments in the United States that engages in aerial firefighting at night (the other two are in Los Angeles City and County). San Diego and Los Angeles are willing to take on the danger and expense due to the large areas susceptible to fire, such as wild lands and urban areas in Southern California.

To minimize the risks to nighttime aerial firefighting, SDFRD uses specialized equipment. Its helicopter is equipped with a gimbal-mounted camera package that provides a 360-degree range of view. Funded by the U.S. Department of Homeland Security (DHS) Urban Area Security Initiative (UASI) grant, the gimbal supports a forward-looking infrared (FLIR) camera, a color camera, and a laser.

With the infrared camera, SDFRD Helicopter Rescue Medic Steve Vandewalle said he can plot the edge of a fire on the camera's screen and calculate the acreage affected. If he enters an address into the package's onboard computer database, the camera will point in that direction and display the location on the screen. The laser in the package then indicates the waypoint, similar to a global positioning system (GPS). The pilot can fly by following the laser beam that can only be seen with night vision goggles (NVG), a tool that amplifies ambient light by a factor of 6,000. While NVGs help nighttime flying a great deal, they do not make everything visible. "You have to be familiar with the area, because the goggles let you see the power poles but not the lines," said Vandewalle.

Waypoints in the system enable the helicopter to automatically redirect itself to a location when it needs to make return trips for transporting multiple victims or refilling water tanks. The infrared camera in the package allows the rescue team to use heat signatures to locate victims more easily and aid victims who are not reachable by ground crews. Vandewalle said the helicopter can pick up victims without even landing. He lowers himself to the ground via a hoist cable, drops off paramedic gear, stabilizes the patient, and hoists himself and the victim back into the helicopter.



Photo courtesy of Steve Vandewalle, SDFRD

No More Flying Blind (continued)



Photo courtesy of Steve Vandewalle, SDFRD

The SDFRD helicopter carries a medium-size water tank – the largest tank available for night firefighting. In the daytime, the helicopter can hover over water and use a snorkel to refill its tank in less than 17 seconds. At night, the water tank must be refilled by a tanker truck, because when hovering over water, the helicopter’s blades spray small water droplets into the air. These droplets reflect light, overwhelming the NVG and obliterating visibility. It takes less than a minute to refill the tanks by tanker.

Nighttime aerial firefighting provides several advantages. The cool night air and diminished winds slow fires’ growth, making water three times more effective. “A wildfire can be extinguished [at night] in approximately one-third of the time that it takes to do so in the daytime,” said Vandewalle. Nighttime firefighting also has less danger of injuring ground crews with falling water, which can weigh as much as 3,000 pounds. Night operations also mean that the flight crew does not have to contend with media or sport aircraft.

Another enormous advantage of nighttime aerial firefighting is that “small fires are kept small because crews don’t have to wait until daylight to fight the fire,” said Vandewalle. “Using this resource also helps to make large fires small enough for the ground crews to handle.”

Vandewalle says that although his department has the capability to fly to fires at night, it does not do so unless human lives, high-value resources, or infrastructures are threatened.

For more information about SDFRD, visit www.sandiego.gov/fireandems.

EAGLE’S EYE VIEW

Virtual Alabama Provides an Invaluable Perspective

In the aftermath of Hurricane Katrina, the Governor of Alabama deployed reconnaissance planes to assess the damage. Unfortunately, the captured imagery only told the Governor half the story, because state agencies could not access photographs of the coastline before the storm for comparison. According to Jim Walker, Director of the Alabama Department of Homeland Security, the needed orthographic imagery of Alabama did exist, but it was difficult to obtain from the owners in a timely manner. This prompted Alabama Governor Bob Riley to push the agency to create a statewide operating system that Walker says has become the most comprehensive database of imagery in the United States today.



Photo courtesy of the Alabama Department of Homeland Security

Virtual Alabama allows responders to display plume models over area imagery.

Eagle's Eye View (continued)

Alabama sought assistance with this new technology from the U.S. Army and the U.S. Space and Rocket Center, both familiar with geographic information system (GIS) imagery. After researching several companies and programs, Alabama chose Google Earth as its platform for a scalable and maintainable program. "We bought a license to Google Earth and started pleading with whoever had the imagery in the state to give it to us," said Walker. The State of Alabama also made efforts to obtain relevant information from various agencies, including revenue and environmental management offices. Alabama made the case that having every county's imagery loaded onto a common platform would be an excellent use of the agencies' information and would serve each agency's mission. With the information thus obtained, the State started development of what is now called *Virtual Alabama*.

Virtual Alabama is a visualization tool that provides imagery and corresponding layers of information, such as gas and water lines, property boundaries and owner information, and flood plain information. The State has loaded every Alabama county into the system and grants access to first responders and government officials free of charge. Currently the system has 4,000 registered users in the state and over 1,100 participating agencies.

In October 2008, Walker demonstrated *Virtual Alabama* to the User Working Group of the U.S. Department of Homeland Security (DHS) Science

and Technology Directorate's First Responder Technologies (R-Tech) program. This advisory group shares its expertise with R-Tech on technologies of value to first responders. Walker illustrated how one could zoom into the imagery much like one does when searching for their house on Google Earth.

Walker also showed imagery from Montgomery County and displayed three-dimensional (3-D) models of every building – including the location of hazardous materials – to represent how firefighters or police might use information before sending responders to a scene.

Virtual Alabama can also be used to manage disasters. "We had a tornado hit in Southeast Alabama a year ago in which eight students were killed," said Walker, "and [with *Virtual Alabama*] we were able to have the imagery of what it looked like before the tornado." In the storm's aftermath, the State knew within a matter of hours what damage was done and could easily report the results to the Federal Emergency Management Agency (FEMA). The State also had to measure the amount of loss to qualify for federal assistance, so it overlaid the images of the devastated areas with information about revenue, appraisals, and ownership of the properties and measured the financial losses quickly.

Virtual Alabama already meshes imagery taken by different standards and vendors, and in different years. Nevertheless, it is a work in progress,



The screenshots from *Virtual Alabama* show before and after images of an area devastated by a massive tornado that ripped through Enterprise, Alabama in 2007.

according to Walker. The State continues to add new and relevant data to increase the number of locations and layers of information. More recently, *Virtual Alabama* gained the capability to track and type resources. Fire stations can document information about apparatus, equipment, personnel, and response capabilities, and supplement this information with 3-D models and images. These data sets are easily accessible through *Virtual Alabama* by clicking on a fire station on the map.

Eagle's Eye View (continued)

The next big step for *Virtual Alabama* is a school safety pilot program. With funding from DHS, Alabama plans to pilot the ability to access and secure internet protocol (IP) security cameras in the schools and upload video feeds to the system. By combining access to those cameras with decision support tools and class registration data, *Virtual Alabama* can determine student density in every room, a great help in evacuation procedures. Walker explained, "First responders can then see which classrooms are populated at a given time and, therefore, save time kicking in doors to rooms that are empty."

Virtual Alabama also has real-time access to Department of Transportation cameras and can track traffic and the speed of cars. In addition, the system can use existing plume modeling software to populate information from weather centers in real time in order to determine potential paths of harmful toxins during a chemical spill and couple that with other information on infrastructure to enhance disaster response abilities.

Walker believes that any homeland security director in the country can afford a similar system for their state. He said that Alabama obtained the imagery free of charge because much of it was available from state offices and departments, and the rest was provided by local owners of additional imagery who recognized the value of the system. *Virtual Alabama* was developed in less than two years for less than \$1 million that included \$150,000 for a license from Google in perpetuity.

For its innovations in government and technology, *Virtual Alabama* has received awards from the National Governors Association, the Council of State Governments, the American Council for Technology, and Government Technology Magazine, and it is the first public sector recipient of the Google Enterprise Superstar Award.

For more information on *Virtual Alabama*, go to www.dhs.alabama.gov/virtual_alabama/home.aspx.

REALITY SHOW

Realistic Wound Products Prepare First Responders for the Field

Although rescue workers spend countless hours training for victim search and rescue (SAR) and triage, nothing prepares them for the first time they have to locate and treat real injuries.

Sue Bulanda, a SAR incident commander and cadaver dog trainer for more than 25 years, said that many SAR workers do not return to work following large scale disasters. "Responders have major problems after these events, because they did not receive a critical incident stress debriefing," she said. To better prepare first responders, Bulanda wanted SAR dog handlers and their dogs to have the opportunity to train with realistic wounds and body



Photo courtesy of Techline

Reality Show (continued)

parts. "Even though a dog can have many years [of] successful training on scented PVC tubes or jars, it would be a benefit to the handler and the dog to have realistic objects to train on," Bulanda said.

Mine Rescue Coordinator Harry Lovely also wanted more realistic materials to use in mine emergency response drills (MERD). A trainer of mine rescue techniques for 15 years, Lovely works in Edgar Mine, an underground mine in Idaho Springs, Colorado that is closed to production. The mine is equipped with theatrical smoke and adjustable ventilation. To simulate wounds, Lovely used vinyl wounds and highly realistic moulage (molded) makeup. These simulated wounds sometimes took hours to apply and required frequent touchups. To improve the exercises as well as save money, he searched for new products that would fulfill the same functions.

Both Lovely and Bulanda now use newly developed polymer simulated wounds and body parts. Produced by Techline Technologies, Inc., the products are clinically accurate, three dimensional, and capable of pumping out blood.

The production process of a polymer simulated wound begins with choosing a photo of an actual

wound from a catalog compiled with input from both civilian responders and the military. "We determine which ones [wounds or injuries] would best meet training requirements, what the most important anatomical landmarks are, and then they are evaluated by a Navy [Hospital] Corpsman and a pathologist," said David Parry Jr., one of the owners of Techline. Once a model is approved, a staff of artists, chemists, and engineers make a mold and create the device.

The materials of the simulated wounds have survived testing in the harshest environments for over 10 years. "Simulations must survive multiple uses and rough handling, so we've made them from pliable polymers to withstand tearing," said Parry. The colors of the wounds themselves are dyed into the material instead of painted on, making the color permanent.

Wound kits are provided with blood bags and reservoirs for bleeding effects. In training, first responders must apply a tourniquet or pack wounds just as they would in an actual emergency in order to stop bleeding. Wound kits include face lacerations, gunshot wounds, compound fractures, impaled objects, burns, and amputations. Techline also offers a blast injury kit that includes strap-on limbs and facial injuries that simulate injuries caused by improvised explosive devices (IEDs). "The beauty for me with these devices is that in a matter of seconds I can put this on them, and even if I don't do anything else, there is a lot more shock value than before," said Lovely.

Techline started developing severe trauma simulations in 2007 after it secured funding from the United States Army Research, Development and Engineering Command (RDECOM) to improve moulage. The company then began developing wound simulation products to train civilian and military units for mass casualty situations. To enhance realism, and thereby the effectiveness of training, wound simulation products for the military contain hard bone, odor, and other features. To make the simulations more affordable for civilian first responders, the company developed versions of products with a softer material and made the odor feature optional.

For more information on Techline's polymer simulated wounds, visit www.techlinerocks.com.



Photo courtesy of Techline



THE RESPONDER KNOWLEDGE BASE

Standards on the RKB

The U.S. Department of Homeland Security (DHS) adopts standards for emergency response equipment based on the nation's prioritized needs. As DHS selects these standards, it makes them available on the Responder Knowledge Base (RKB) at www.rkb.us.

The RKB currently has 5,743 product records from over 1,300 organizations, including such key Standards Development Organizations (SDOs) as the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers (IEEE), the National Fire Protection Association (NFPA), the National Institute for Occupational Safety and Health (NIOSH), and the National Institute of Standards and Technology (NIST).

First responders can determine on the RKB Website whether a standard is available for a given product type, if a product has been tested by a certifying agency, and if the product meets that standard. This testing information is available in the "Knowledge Links" box on the right side of a product page. If the product has been certified to any standard(s), the box will include a "Third Party Certification(s)" section. The "Certified To" section shows what standard(s) the product has been certified to. RKB displays both current and expired certifications.

For more information, contact the RKB Help Desk at 877-336-2752. For specific questions related to a product, contact the manufacturer using the information provided on the product record.

Home	Products	Grants	AEL/SEL	Other Content	Ask An Expert	MyRKB	Keyword Search
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Products
 Operational and US&R Equipment \ Tools

AMK-21 Cutter

Information Provided By: AMKUS, Inc.
Manufacturer: AMKUS Rescue Systems
Model Number: AMK-21 Cutter
Part Number: 210200001000

Description: AMKUS Rescue Systems introduces the AMK-21 Cutter with UNIQUE 360 degree rotating handle. The AMK-21 features 8 locking positions for the handle, allowing the rescuer to set-up the tool for natural hand placement at any angle of attack. Departments can specify the position of the control valve- left, right or centered, in relation to the cutting blades; this can be specified at the time of ordering. It delivers the cutting power needed for any automotive application in a remarkably compact package.

Availability: not provided
Availability Notes: not provided
MSRP: Contact Company for Pricing
Product Dimensions: (L)26.5 inches x (W) 9.0 inches x (D) 8.0 in
Weight: (ready to use) 33.25 lbs

Information Provided By:
 AMKUS, Inc.
 2700 Wisconsin Ave.
 Downers Grove , ILLINOIS 60515
 UNITED STATES
 630-515-1800
Email: experts@amkus.com
Website: www.amkus.com



AMK-21 Cutter

Knowledge Links

Third Party Certification(s)

- ❌ EXPIRED-SEI - NFPA 1936-1999 AMKUS Hydraulic Cutter
- ✅ SEI - NFPA 1936-2005 - AMKUS Hydraulic Cutter

Certified To

- NFPA 1936-1999 Edition Standard on Powered Rescue Tool Systems, 1999 Edition
- NFPA 1936-2005 Edition Standard on Powered Rescue Tools, 2005 Edition

Relevant Publication(s)

- List of Standards Adopted by the Department of Homeland Security
- List of Standards Adopted by the InterAgency Board

Related Product(s)

- 5 found; [click here to see all items](#)

Related SEL Item(s)

- [03SR-02-TPHY] Tools, Power, Hydraulic

How to report problems with this product:
[Problem Reporting Information](#)