

The Humvee Rollover Trainer: An Officer's Quest To Save Lives In Combat

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Introduction

The US military procurement system does not normally work in favor of an individual soldier who has a good idea. To fund, build, and field a new training device requires years of navigation through countless layers of the defense establishment bureaucracy. This paper describes the successful efforts of a young officer who, armed with exceptional persistence and an innovative spirit, took a great idea from a back-of-the-napkin concept to operational testing in less than seven months. The story of the Humvee Egress Assistance Trainer, or HEAT, is an extraordinary tale of a military officer's quest to save the lives of soldiers. The impact of the HEAT fielding is measurable: Military vehicle rollovers and associated fatalities in combat each dropped by more than 60% in the two years following the fielding of the Humvee rollover trainer.

Background

The United States Army had a serious problem and no one quite knew what to do about it. It was 2005 and the Army's High Mobility Multi-Purpose Wheeled Vehicle, the ubiquitous Humvee, was rolling over at an alarming rate during combat operations in Iraq. The problem confounded commanders, senior non-commissioned officers and military safety professionals: How to stop the rollovers or – at a minimum – make the events survivable. Chief Warrant Officer Three (CW3) Rik Cox had an idea, one that had been discussed by various military leaders and safety personnel, but had never been aggressively pursued. What if vehicle occupants could experience a realistic rollover simulation in training? Vehicle occupants could know exactly how to react. The driver and gunner could be trained to recognize the feel of the 25° angle at which the top-heavy Uparmored Humvee tips over. In addition, the occupants would recognize the value of using seatbelts, even in combat.

Cox was the lowest ranking officer in the US Army's Forces Command (FORSCOM) Safety Division, an office of military safety professionals 6,700 miles from the sands of Iraq. As the man who collected and analyzed the daily casualty reports, Cox saw the same accident causation entry over and over again: *Humvee Rollover*. The accompanying injury descriptions were predictable: *Fatal Head Injury, Broken Back, Paralysis From Broken Neck*. Gunners perched in the roof-mounted turrets had another repetitive entry: *Killed When Thrown From Vehicle*. Another tragic fatality cause: *Drowned When Trapped In Overturned Submerged Vehicle*. Rik Cox was a man with a mission. He was going to save lives by preventing rollovers.

Ground vehicle simulation training had never advanced past the “good idea” stage; however he was going to take the lead in the effort to develop a training device. He was unaware at the time the road ahead would prove extremely difficult, taxing his considerable resolve and determination.

Cox was an officer in the US Army Reserve and a member of the FORSCOM Safety Division’s Army Safety Augmentation Detachment (ASAD). Since 9/11, the ASAD, a 110-person organization comprised of trained Ground and Aviation Safety Officers, had mobilized and deployed sixty officers and non-commissioned officers as individual augmentees to military staffs in Iraq, Afghanistan, and Kuwait. With the exception of aviation units, the typical Army brigade was not staffed with a full-time safety officer in 2003. Although division and corps-level staffs had civilian safety managers, they also tapped the ASAD help to manage the increased workload in a combat environment.

In April 2003, the phone rang in the Cox household in Bonaire, Georgia. Like hundreds of thousands of Army Reserve soldiers, Rik Cox was being recalled to active duty to participate in the Global War on Terror (GWOT). He was ordered to return to military duty from his position as a Bioenvironmental Engineer at Robins Air Force Base in Warner Robins, Georgia. Unlike most recalled Reservists, Cox would remain stateside and in the fall of 2003 he was given the task of managing thousands of casualty reports flooding FORSCOM headquarters in Fort McPherson on the southern outskirts of Atlanta. There were unanswered questions about accidental losses, causation, and effective mitigation; Cox was put to work analyzing the data. The Army leadership at all levels, armed with data from FORSCOM Safety and the US Army Safety Center, recognized the tragic unintended consequences of the accelerated effort to provide armor plating for the Humvee, the workhorse of the military’s wheeled vehicle fleet. Whether the Humvee was equipped with bolt-on armor plating or factory-installed ballistic protection, the vehicles were rolling over at an alarming rate. Although there had only been 17 fatalities from 72 Humvee rollovers in the five years before GWOT hostilities began in 2002, 90 soldiers had been killed and 159 injured in vehicle rollovers during the first two years following the invasion of Iraq on March 20, 2003. (1)

The addition of heavy armored gunner turrets to the roof raised the Humvee’s center of gravity, increasing the rollover tendency. The prevailing “drive it like you stole it” mentality further exacerbated the problem. With the approval of their commanders, soldiers often drove in excess of 80 mph to minimize exposure to insurgent-activated improvised explosive devices (IEDs), especially when the insurgency began in the late summer months of 2003. If they made rapid or abrupt movements of the steering wheel, the laws of physics were unforgiving. The moment arm during a roll was especially brutal to the gunner, who was unsecured and elevated above the cab. The Humvee’s two-point seatbelt, which the Army had been upgrading to a three-point system at a glacial pace before the GWOT began, was too short to fit around a soldier wearing the newly-issued body armor vest. It was poorly constructed and often fell apart. The Army had no effective restraint system for the Humvee and soldiers were paying the price.

FORSCOM was not the only Army Command seeking a solution to the Humvee rollover problem. Many experienced military safety professionals in these Commands focused on the development of a simulation training device. Statistical data from helicopter crashes clearly proves the value of egress training – survivors of crashes are 250% more likely to safely get out of the wreckage if they have been previously trained on proper egress procedures. (2) Applying the same logic to Humvee drivers and crews, a simulated rollover during a controlled pre-combat training event would likely allow vehicle drivers to avoid the roll, turret gunners to drop down inside the cab before the roll began, and buckled up occupants to survive the accident. Cox also

believed the best solution to the rollover problem was a simulator. He outlined out his idea to FORSCOM Safety Director Mike Bledsoe. Following a March 29, 2006 accident prevention brainstorming session with the FORSCOM Command Group, Bledsoe returned to the office and asked Cox, “Do you really think you can build this rollover training device you’ve been talking about?” Cox replied “I’d like to try.” Bledsoe gave him the green light to pursue his idea, but could not promise any financial support.



Exhibit 1: Adding protective armored plating and a turret raised the Humvee’s center of gravity and created an extremely top-heavy vehicle.



Exhibit 2: One soldier was killed in this November 17, 2005 Humvee rollover in Northern Iraq near Tal Afar. He was not wearing his seatbelt.

At least two sister Army Commands were reviewing design concepts by contractors, some with price tags in excess of \$1 million. Concurrently, others were scouring the country looking for a Humvee chassis to serve as a prototype to minimize cost. Unbeknownst to many taxpayers, the Department of Defense has a program to reuse old material and equipment, to include damaged vehicles. The Defense Reutilization and Marketing Office (DRMO) has locations throughout the world, including Iraq, Kuwait and Afghanistan. Ironically, DRMO's stateside efficiency caused a problem. There were no Humvees in the boneyards, or so it seemed. Rik Cox began his search by phone and eventually found a Humvee damaged in a wreck in a DRMO yard in Montgomery, Alabama. "We were just getting ready to cut it up for scrap next week," replied Tim Carver, of DRMO Montgomery. "It's been sitting here a couple of years." Cox lauds the efforts of Carver, who was willing to hike through acres of vehicle hulks in the scorching Alabama summer heat, find a vehicle matching Cox's description, and capture and send a digital photo. He later discovered Carver was a retired master sergeant from the Alabama National Guard. It was the first of many instances in which patriotic Americans who sought a way to contribute to the war would make an extra effort when they realized the stakes of the project when Cox presented his unusual requests on the phone. The key was his description of the desired objective. Beginning his conversations with "I want to save the lives of our soldiers," energized ordinary clerks, drivers, mechanics, and administrators. Cox had his Humvee.

"What's your funding code?" asked Fran Allor of the Fort Benning, Georgia Transportation Office. Cox laughed and said "I have no money!" After all the time and effort to find a Humvee hulk, getting it to Atlanta was the next step. "Let me get back to you," she said, impressed with the warrant officer's straightforward approach. A few days later, she found an extra \$500 in the budget and the Humvee was on its way to Fort Gillem, Georgia, 170 miles to the northeast. As the flatbed was making its way to Georgia, Rik Cox was driving around Gillem. A quiet little Army post on the east side of Atlanta, it is the home of the Army Reserve's 81st Regional Readiness Command Equipment Concentration Site 43 (ECS 43), a maintenance outfit composed of military technicians. The mil-techs were mechanics who are federal employees during the week and become Army Reserve soldiers for weekend drill periods. Al Martelly, the ECS 43 Manager, and Sergeant Major Martelly when he put on his Army Reserve uniform, recalled the short, ruddy faced warrant officer who kept driving by his maintenance yard. Cox finally came in the maintenance bay, introduced himself, described his Humvee rollover trainer project, and asked for a place to temporarily store the Humvee cab due to arrive from Montgomery. The last thing ECS 43 needed was another distraction. With the war raging, mechanics were a month behind on scheduled projects. Martelly's shop foreman initially rebuffed Cox, but Martelly was impressed when the persistent but polite officer returned again asking for help. Like Tim Carver and Fran Allor, Art Martelly could see the value of the project and was willing to find a way to contribute. He gruffly replied that maybe he could let some of his mechanics assist when things were slow in the shop and maybe he could spare the forklift now and again. Cox had his maintenance support, even if it was tenuous.

Rik Cox had a solid educational foundation with an undergraduate degree in English and a master's degree in Biology. This was excellent preparation for work as a Bioenvironmental Engineer, but he hadn't had spent much time in mechanical engineering classes. "What you need is a metal frame to set this thing on," advised CW4 Art Jordan. "You got to find a steel frame." Jordan, one of the most experienced maintenance technicians in the Army, was at stationed at Fort Gillem. He was also a race car enthusiast and had a nuts-and-bolts familiarity with metallurgy. Jordan couldn't help but like his fellow warrant officer's drive and dedication. He estimated the weight of the modified Humvee cab that was to be rotated on a shaft to be about 2,500 lbs. "But that's just an estimate," he warned.

“Where will I find a steel frame?” wondered Cox as he sat at a stoplight in McDonough, Georgia a few days later. He absent-mindedly glanced to his right and saw a junkyard filled with metal scrap. Moments later, junkyard attendant Blake Belcher saw a curious sight. A military officer in uniform strode over to him through the mud and asked, “Can I walk around your junkyard and look for steel?” For the next three days, Blake and his brother Frank watched with bemusement as Rik Cox walk around the yard looking at metal. Although it was clear he was unsure what he was searching for, Cox was persistent. And then it happened, the “Eureka Moment.” As a large pile scrap was being moved behind him, Cox turned around and saw a beautiful sight. A six and a half foot wide steel frame with three A-frame supports welded to the base. As his mouth dropped open in amazement, he thought “That’s it. That’s what it will look like.”



Exhibit 3: Cox’s “Eureka Moment” was the discovery of this scrap metal frame in a McDonough junkyard. It would become the base for the first rollover trainer.



Exhibit 4: Identifying, procuring and transporting this wrecked Humvee cab from the Montgomery DRMO yard were the first critical steps in the development of the trainer.

Now it was time to get the frame to Fort Gillem, 20 miles to the north. Cox, with no money to spend on the project yet, asked Blake if he would be willing to donate to the cause. Blake readily agreed and loaded the frame on a trailer and transported it to Fort Gillem, volunteering his time and equipment for the good of soldiers. A few days later the Humvee cab arrived from Montgomery. Cox now had his cab, frame, work space, and maybe a little bit of ECS 43 labor.

Although he was not an engineer and still very unsure of the final design, Cox knew that the wrecked Humvee had to be substantially modified. All portions of the vehicle to the front and rear of the cab had to be removed. There were 93 inches between the vertical support braces on his prized metal frame; the passenger compartment could be trimmed back to 87 inches in length. He was in luck. Armed with tools from his garage, Cox began to dismantle the Humvee in the hot July sun.

Once again, fate smiled on CW3 Rik Cox. Bledsoe told FORSCOM Command Sergeant Major (CSM) Carl Christian, who was keenly aware of the Army's Humvee rollover problem, about the fledgling project. "After a meeting at Fort Gillem in early July 2005," recalls Christian, "My driver and I rode around the post looking for this thing. We pulled to a maintenance yard and here was this young officer covered in grease trying to dismantle a Humvee with hand tools. 'Chief, you'll never get this done!' I told him. But he was a stubborn man and wouldn't let go of his baby. Chief Cox had gotten this far and wasn't about to turn it over to someone else." (3) However, as the senior-ranking NCO in the Army's largest Command, Christian had access to money, a resource Cox badly needed. He could also use his considerable sway to suggest that subordinate units consider providing assistance, workload permitting.

As it turned out, the FORSCOM CSM's influence wasn't needed right away. When Cox approached Martelly requesting assistance disposing of a few gallons of fuel in the Humvee, the ECS 43 Manager dispatched three mil-tech mechanics to the site. Staff Sergeant James Jett, Sergeant Mickey Hill and Specialist Christopher Whiting were, Cox muses, "like angels from heaven" when they arrived with a heavy-duty Army wrecker and a 5-ton truck. They echoed Christian's initial response. "Chief, you'll never get this thing apart. Let us help you." It was music to the warrant officer's ears. Over the next three months, Jett, Hill and Whiting would dedicate countless off-duty hours (and some duty hours when Martelly could make time) to cutting, welding, sheet metal work and myriad other tasks. Their work balancing the cab on a rotary shaft and mounting it on the steel frame was masterful, as it was done without the aid of computer-assisted design programs or sophisticated engineering tools. On September 29, 2005, Jett called Cox and left a message on his machine. "Chief, right now I'm suspended upside-down in a Humvee. Give me a call." "Finally!" Cox thought. The Humvee rollover trainer cab was mounted on its frame and rotated 180° for the first time.

Convinced that a truly effective rollover simulator had to replicate the Uparmored Humvees in Iraq, Cox began calling around the US to get materials. Humvee seats came from Marine Corps Logistics Base, Albany, Georgia. Seatbelts appeared one day, a gift from Clarence Cox in FORSCOM G-4/Logistics. Fort Polk donated fiberglass doors. Many of the items were donated, some had to be purchased. But one of the most critical items was proving nearly impossible to obtain. Designed to absorb the blast of an IED, Uparmored Humvee doors weigh 300 lbs each. Humvee rollover survivors, especially those who had escaped from a vehicle submerged in an Iraqi canal, consistently highlighted the need to ensure occupants know how to open the heavy doors. A true simulation of the difficulty of exiting an upended Uparmored Humvee – not always neatly positioned upside-down – meant mounting armored doors.

In July, the phone rang on Carl Christian's desk in the FORSCOM headquarters. "I need some money and your horsepower," said Cox. In addition to the obstacle of a \$3,000 price tag, the armored doors simply couldn't be procured. In response to the escalating IED threat, the Department of Defense energized military contractors to dramatically escalate Uparmored Humvee production and retrofitting of existing Humvee with Add-On-Armor kits. Although production lines across the country were now operating around the clock to meet the demand, no one was willing to part with four armored doors bound for a combat zone where soldiers continued to operate Humvees with canvas doors. And Cox couldn't find the right leader or manager who had the latitude to weigh the value of a realistic rollover trainer as an accident prevention tool and make the decision to divert doors to Fort Gillem. Christian went to work and in late August 2005, four armored doors arrived at the ECS 43 maintenance building. Martelly had found space in his facility for the curious contraption that was starting to garner quite a bit of attention. Cox had his doors.

"You can't do this!" "Stop that project now!" "That has to be designed, engineered, and tested by *this* Office!" Bledsoe was receiving the phone calls. Word was spreading about Cox's little unfunded project and the naysayers were throwing up obstacles. "You keep working, Rik," directed Bledsoe. "I'll take care of these people."

Bledsoe admired his young officer's drive and dedication, but knew he would reach a point at which his lack of mechanical engineering expertise would become a problem. Cox would have to loosen his grip on the rollover trainer. Bledsoe directed him to contact the Atlanta office of the US Army Corps of Engineers. Once Cox described the objective of the project, two engineers readily agreed to volunteer their time. In August 2005, Jim Pace and Tracy Hendren joined the team.

From the beginning, Cox was unsure how to control the rotation of the cab on the horizontal shaft. Initial thoughts about using ropes powered by a half-dozen soldiers on each side of the device proved impractical. Pace and Hendren had a solution. A properly positioned hydroelectric motor could rotate the cab in a controlled manner, allowing the operator to stop the trainer at any angle. Once again Carl Christian came to the rescue, providing another \$3,000 for the motor. The brake system symbolized the cost-driven ingenuity which was the hallmark of the project. Instead of reinventing the wheel, the team modified a hydraulic brake system from a commercial forklift. The Corps of Engineers volunteers provided another critical skill set. Since both Pace and Hendren were Registered Professional Engineers, Bledsoe now had a ready answer to the howls of protest posed from other organizations about occupant safety and mechanical soundness. He could now defer to acknowledged subject matter experts.

Cox knew the public relations aspect of his project was a daily challenge for the FORSCOM Safety Division. He also knew the name assigned to the rollover device would be important. The Army's affinity for acronyms would probably cause the Humvee Rollover Trainer to be dubbed the HRT, or "Hurt." Aware this nickname would exacerbate the anxieties of potential trainees and probably make the device an object to inspire fear, Cox launched his own mini-PR campaign. The rollover trainer was named the Humvee Egress Assistance Trainer, or HEAT. To this day the name is unchanged. (Ironically, this has unintentionally created a PR problem for the developers of another present-day rollover training system for the newly-fielded Mine-Resistant Ambush-Protected vehicle, the MRAP. Wags have begun referring to the MRAP rollover trainer as the "MEAT." Time will tell if that acronym – and the inevitable jokes – will stick.)

On October 24, 2005, less than seven months after Cox was given approval to pursue the project, the first HEAT was operational. The entire project, not including thousands of volunteered man-hours, generosity by suppliers, and reclaimed materials, cost under \$14,000. The HEAT was capable of seating four combat-equipped soldiers with their weapons, ammunition cans, and other cargo. All occupants were secured in place with the same seatbelts used in Iraq. The hydroelectric motor and brakes allowed the operator to rotate the cab 25° on either side to demonstrate the tip-over point. The HEAT could be rotated to any angle and safely stopped in place. Laden with standard combat kit weighting upwards of 50 lbs and their assigned weapons, occupants struggled mightily as they released their seatbelts, collapsed into an ungainly upside-down heap, and dealt with disorientation, three other sets of kicking feet, and the daunting task of getting the armored doors open.



Exhibit 5: Jett, Hill and Whiting mounting the Humvee cab on the steel frame in an ECS 43 maintenance bay



Exhibit 6: The hard work of Cox, Jett, Hill and Whiting: the HEAT starts to take shape.

At the November 17, 2005 FORSCOM Commander's Conference, the HEAT was introduced to the senior leadership of the 750,000-man Command. Cox and his band of ECS 43 mil-techs, who Martelly authorized to reschedule weekend Reserve training drills to support the conference, placed the HEAT in the parking lot behind the FORSCOM headquarters building at Fort McPherson. The trainer was an immediate magnet for attention. Ironically, the biggest fan was from another service, Air Force Major General Lee McFann, commander of the USAF Safety Center and a guest speaker at the conference. After McFann emerged from his simulated rollover in the HEAT, he turned to the officer and NCO accompanying him. "Figure out how to buy these," he ordered. Cox smiled. There was no procurement process or fielding plan and at least three Army organizations were calling the HEAT unsafe, untested, and unnecessary.



Exhibit 7: October 24, 2005. Chief Warrant Officer Three Rik Cox conducts the first operational test of the HEAT at Fort Gillem

Colonel John Gallagher was the Coalition Forces Land Component Command (CFLCC) Reserve Affairs Liaison Officer. The day after the November 2005 FORSCOM Commander's Conference, he was completing his mid-tour leave. He was scheduled to fly back to CFLCC's Kuwait-based headquarters the next day. As Gallagher and his wife walked across the parking lot behind the FORSCOM headquarters on the way to the PX, he caught a glimpse of the HEAT. "I didn't know we had any Uparmored Humvees stateside," he thought. He led his wife toward the odd-looking contraption, thinking he would show her the Army's newest combat vehicle upgrade. Cox was putting all comers in uniform into the HEAT. Other than warning occupants to brace themselves against the roof to prevent neck injuries when unbuckling while upside-down, he was giving no instructions. "I was trying to give them the same preparation that our soldiers were receiving in Iraq," Cox explained, "Which was none at all." Gallagher wanted to know about the trainer. Cox strapped him in and rolled the HEAT 180°. Like many occupants, Gallagher took nearly five minutes to unbuckle, orient himself, open the armored door, and get out of the vehicle. As always, Cox, Jett, Hill and Whiting were standing by prepared to help, but Gallagher wanted to experience the realism of an unassisted egress. When he finally clamored out, he was sold. "Give me everything you've got on this, Chief. We need it in Kuwait as soon as possible." The

HEAT now had a high-ranking champion in Kuwait, where all soldiers bound for Iraq are trained before crossing the border northbound into combat.

Lieutenant General Steven Whitcomb, the CFLCC Commander, would soon share Gallagher's enthusiasm. Armed with Cox's plans and money to spend, CFLCC engineers and safety professionals



Exhibits 8 & 9: The trailer-mounted CFLCC version of the HEAT is fielded in Kuwait. Note the flip-down access platforms and safety guards.



Exhibit 10: CFLCC HEAT access platforms and safety guards in position

built a HEAT trainer in six weeks. CFLCC's HEAT improved on the original design and was mounted on a trailer. It added platforms for easy access to the cab and rails on the sides of the platforms. A team of engineers and safety professionals produced a prototype for a January 2006 Safety Stand-Down Day. They put LTG Whitcomb inside and rolled him over. Like Gallagher, Whitcomb was hooked. "Make this happen – I want every soldier who goes into Iraq to receive this training," he directed. Within three months, HEAT training was a mandatory event for all soldiers before movement forward into combat in Iraq.

Word of the rollover trainer was spreading. Fort Polk, Fort Drum, and US Army Europe built HEATs. Following an April 2006 rollover accident in Mosul, Iraq, near Forward Operating Base Diamondback, Lieutenant Colonel Ron Green, Commander of the 142nd Corps Support Battalion, asked the safety officer investigating the incident what he could do to prevent future



Exhibit 11: A soldier experiences a typical ungainly exit from an upended HEAT



Exhibit 12: A soldier suspended by his seatbelt prepares to unbuckle as the HEAT rotation is stopped at the 180° point. The weight of one's body armor, helmet, and weapon (not shown) often creates an ungainly, upside-down heap when the seatbelt latch is released.

Most soldiers have great difficulty during their first rollover in the HEAT. During subsequent iterations at various angles and in the dark, they learn techniques to safely exit the vehicle. By all accounts, the HEAT is one of the most realistic military training devices ever fielded.

rollovers. Within hours, Cox's now-popular engineering drawings were in his hands. Green handed them to his senior Maintenance Warrant Officers and NCOs. Two months later, on June 14th, at the FOB Diamondback Army Birthday Cookout, Green unveiled the first HEAT built in Iraq. This version was mounted on a flat-rack and could be transported by an Army Palletized Loading System (PLS) truck. At Green's direction, the Mosul HEAT had been built exclusively with parts with National Stock Numbers (NSNs), so all components were available in the US Government supply system. The price tag for the Mosul HEAT was \$15,000. Cox was thrilled. Only 15 months after he took on the mammoth project, soldiers in combat were being trained to prevent and survive Humvee rollovers.

But the real test of the effectiveness of the HEAT would be whether it reduced rollovers and associated fatalities and injuries. A key indicator was the influx of testimonials from soldiers who survived a rollover. The first positive report came from an unusual source, soldiers from the Army of the Republic of Georgia, an American coalition partner with forces deployed in Iraq. On March 29, 2006, newly arrived Georgian soldiers were trained in the HEAT as part of CFLCC-run pre-combat exercises at Camp Udairi, Kuwait. The following day, a Georgian crew rolled a Humvee. The April 12, 2006 issue of *Desert Voice*, the Army's military magazine in Kuwait, printed the success story.

Learning how to react in extreme circumstances saved the lives of Georgian soldiers. During a training exercise, a Georgian gunner and his crew walked away with minor injuries from a HMMWV [Humvee] rollover accident April 1, 2006 at Udairi Range. Georgian Forces received the HMMWV Egress Assistance Trainer or HEAT course the day before the accident and credit the training for the lack of fatalities in the accident.

"We did what we were trained to do to survive," said Georgian Cpl. Levani Lomtadze, HMMWV gunner. Traveling on the counter-improvised explosive device lanes, Lomtadze's HMMWV hit a hill and turned over. The vehicle did a complete 360-degree rollover.

Lomtadze said he and his crew felt the vehicle turning and immediately assumed the correct supportive positions to survive. The HEAT provided the Georgian troops with knowledge that helped save their lives, Lomtadze said. "If we didn't take the class we wouldn't have known what to do," he added. (4)

HEAT training was saving lives – and not only in Humvee rollovers. On December 4, 2006, Sergeant Erin Paynther and Private Lekeisha Hawkins, petroleum supply specialists assigned to Forward Support Troop, 1st Squadron, 7th Cavalry Regiment, 4th Infantry Division, completed a night combat refueling mission near Taji, Iraq. As they were driving a High Mobility Expanded Tactical Truck (HEMTT) back to the base, they encountered a downhill slope. Despite the assistance of night vision devices, poor depth perception in the darkness caused Hawkins to lose control of the HEMTT. The tanker, nearly full of fuel, rolled over a small cliff. Both soldiers immediately reacted as they had been trained in the HEAT and emerged unscathed from the vehicle. Said Hawkins, "If we hadn't been wearing our seatbelts there's no telling how we would have landed. The cabs of these trucks have a lot of space and there's a lot of room that you could bounce around in. All the training we had helped to prevent our getting hurt." (5)

Some testimonials were sent directly to Cox. After a Humvee rollover near Sharana, Afghanistan, on April 27, 2007 CSM Charles Turner wrote a personal letter to him:

“We were on patrol visiting soldiers in our CJOA [area of operations]. As we were driving on a mountain road, a van crossed the median and t-boned us, knocking us off the road. I knew immediately that he was a suicide bomber, but for some odd reason his explosives did not detonate. Right then and there is when the HEAT training took over. The van hit us so hard that it had us up on two wheels as we flipped over the side of the road and fell about fifteen feet down into a wadi. I remember stating “Sh**, here we go!” I reached behind me and pulled the gunner down. At the same time I screamed “Rollover, Rollover!” Everyone braced for impact as we landed on the top of our M1114 [Humvee]. We always rehearse our TTPs [tactics, techniques and procedures], which include rollover drills and safety belts being worn during our patrol briefs - which paid big dividends on this particular mission. Thanks again CW3 Cox for what you and your soldiers do each and every day!” (6)

In addition to individual stories applauding HEAT training, Cox could track the dramatic decrease in rollover incidents and associated fatalities in Iraq. There were 384 rollovers which caused 74 fatalities in 2005. During 2006, the numbers dropped to 169 rollovers and 40 fatalities. By 2007, when HEAT training was a mandatory training event in Kuwait before soldiers entered Iraq, there were 147 rollovers and 26 fatalities. The Multi-National Corps-Iraq Safety Office reports rollovers decreased 62% and fatalities dropped 65% from 2005 to 2007. (7) The US Army Safety Center’s end of year report in 2006 highlighted leadership emphasis on vehicle safety and the HEAT as the two most critical factors in the drastic reduction in fatalities. (8)

Afterword - The HEAT Today

Less than three years after Rik Cox began his project, HEAT construction, fielding, and unit training is a fully funded and centrally managed Army-level program. Specially-trained and qualified contractors operate the devices at most stateside military installations, to include Army National Guard installations in most states. Units schedule pre-deployment HEAT sessions months before deployment. The larger operating bases in Iraq and Afghanistan have rollover trainers and it is still a mandatory training requirement when passing through Kuwait. A CFLCC training guide outlines crew egress drills in day and simulated night conditions. Advanced HEAT training requires all occupants to get out using the same door or exit while assisting a simulated wounded crewmember. As of the beginning of 2009, the US Army and US Marine Corps have 53 HEATs in operation, including trainers in Japan, Korea, Europe, Kuwait, Iraq, Afghanistan, and the United States. “Without the dedication, determination and drive of Chief Rik Cox, the Army would not have a rollover trainer today,” asserts Carl Christian, now a retired NCO. “He took this project and made it a personal quest. As a result, there is no doubt in my mind he has saved the lives of our soldiers.”

Today, CW3 Rik Cox’s dream is a reality and the success of the Humvee Egress Assistance Trainer is one of the Army’s most popular and enduring good-news stories. The success is backed by solid statistical data and universal acclaim from soldiers, marines, and leaders at all levels. Cox’s four-year quest, taking the idea from concept to Army-wide fielding, is a tribute to his professionalism. It all began with a crumpled Humvee hulk, a rusty steel frame, and an officer’s burning desire to save soldiers’ lives.

Endnotes

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