



ABERDEEN TEST CENTER THE POINT POSITION



U.S. Army Aberdeen Test Center, APG, Maryland

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Inspiring Voices

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The Women in Leadership (WIL) program began in 2014 to equip, empower and engage the workforce of the U.S. Army Test and Evaluation Command (ATEC) with powerful female leaders. ATC has hosted 10 WIL sessions since its inception. The quarterly events are structured to allow the invited speakers to discuss their personal perspectives on leadership. Each session closes with a question and answer period to allow the audience to ask the speaker about navigating the workplace, leading strategically, handling adversity, mentoring, increasing leadership capacity, maintaining a work-life balance, etc. Participants leave with new ideas, skills, confidence and fresh perspectives to enhance leadership behaviors across our command. The series was once only available to personnel from ATEC. However, under the guidance of former ATC commander COL Morris Bodrick, the fall 2016 WIL session opened the series to the APG working community—men and women alike.

Despite gains in education and in every profession, women remain underrepresented at all levels of

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Outstanding "Women In Leadership" Sessions Enlighten, Empower Workforce

Christina McClung & Erik Myers
Point Position Staff

The U.S. Army Aberdeen Test Center (ATC) recently hosted two Women In Leadership (WIL) sessions, a program oriented toward motivating and inspiring female employees. Presenters are women who have broken through the glass ceiling in their particular career field and are willing to share their experiences.

The two presenters in the spring WIL sessions, Maj. Gen. Barbara Holcomb and Ms. Monique Ferrell, perfectly illustrated the interesting and diverse nature of these sessions.

Testing for Soldier Survivability

Holcomb currently serves as chief of the U.S. Army Nurse Corps and as the commanding general of the U.S. Army Medical Research and Materiel Command at Fort Detrick, Maryland.

When asked about her time as Chief of the U.S. Army Nurse Corps, Holcomb is as direct and efficient with her words as a caregiver approaching an injury. "You're a Soldier first; and an officer second; and a nurse always." Holcomb has found balance in these three separate roles. Her career has led her into a position of leadership, but her time as a caregiver has brought her insight into the necessity of medical advances.

"We do a lot of research in traumatic brain post-traumatic stress disorder, burn care," she says. "That's just in the trauma lane; but then also in the preventive lane, in making someone healthier to begin with so they're more resilient and can withstand harsh conditions from the beginning."



Maj. Gen. Barbara Holcomb

This research into trauma management then makes its way into the public arena. "Civilian institutions are using that [data] because they've learned from our experiences," Holcomb says.

As the featured speaker in the March WIL session, Holcomb also witnessed testing firsthand at ATC, and it was unlike anything she had experienced at Fort Detrick.

"This is the first I've seen [of testing] on the non-medical side," she says of the experience. "I was telling [ATC personnel] earlier when I visited that when you put your Kevlar helmet on, you don't think anything about all the testing that's been done to make sure that it will stop a bullet. You just don't even think about it. You just put it on and assume it will work."

Testing at ATC has obvious effects on the medical aspect of the Army's mission. "I think we're surviving much more complex injuries than we used to," Holcomb says, illustrating the marriage

See **LEADERSHIP**, page 6

Bringing Science to the Soldier

Wendy Allen, Chief, Chemical Sampling and Analysis Branch, Warfighter Directorate

"The important thing is to never stop questioning" – Albert Einstein

The U.S. Army Aberdeen Test Center (ATC) Chemical Sampling and Analysis Branch (CSAB), created more than 30 years ago, supports the development of U.S. Army equipment used by the Soldier. Through the years, the branch has expanded to offer a wide variety of high-quality analytical services used by the military and private industry.

Oil sampling - Military vehicles in the field must be in prime operating condition and at peak effectiveness—this is vital to our warfighters and a critical focus of testing at ATC. The oil sampling analysis laboratory is essential for determining preventive maintenance needs, assessing parts degradation and abnormal component wear, preventing costly repairs and test delays, and warning of catastrophic vehicle failure. "Lubricants analysis involves sampling and analyzing oil to monitor wear and contamination in an engine, transmission, or other lubricating systems," said Mark Michie, a chemist at ATC. "Routine sampling



(INSET) ATC chemist Victoria Freeman extracts a sample from a toxic fumes weapons firing test.

and analysis can help indicate when abnormal wear or contamination is occurring, which affects equipment and reliability. If we protect the lubricant, we protect the equipment."

Toxic fumes - Each time a hand-held or vehicle-mounted weapon is fired from a vehicle, exposure to toxic metal fumes is a danger to the Soldier. At ATC, toxic fumes testing starts with air sampling from the breathing position of each crew member. The samples are brought to the toxic fumes test laboratory for analysis by inductively coupled plasma optical emission spectrometry. Equipped with a plasma torch with a flame temperature up to 10,000 Kelvin, this instrument can

test air samples for toxicity from more than 30 metals.

Unknown samples -

By-products from testing often include unknown samples, such as explosives, plastics, residues, fabric, powder, or even an odor causing ill effects in personnel. These samples

must be identified to learn why the vehicle or equipment failed and to ensure the sample is not harmful or toxic to personnel. "One of the more interesting things we do is analysis of unknown materials, often for failure analysis or accident investigations," said ATC chemist Michael Simone. "We have a wide variety of tools at our disposal. By combining techniques and skill sets within the directorate, we can often come to a definitive cause-and-effect relationship leading up to an event."

Quality standards - Since 2003, CSAB has maintained accreditation with the International Organization for Standardization and the Independent Electrical Contractors (ISO/IEC 17025). "CSAB's robust quality management system ensures our customers receive the highest quality data, enabling them to make informed decisions to ensure our warfighters have the best equipment possible," said ATC's quality manager, Katie Arnold. "Our laboratory has been setting the standard for quality within the testing community for 15 years."

The CSAB team is inspired to excel by our men and women in uniform. Each day, the team strives to provide thorough and accurate test analysis—they never stop questioning—to help ensure the safety of our warfighters.



ATC chemist Mark Michie uses a kinematic viscometer and an atomic emission spectrometer to analyze oil samples in the CSAB laboratory.

Running Interference

Michael C. Geiger

Former E3 Facilities Manager,
Electromagnetic Environmental
Effects Branch, Automotive Directorate

Electromagnetic interference (EMI), or radio frequency interference (RFI) when in the radio frequency spectrum, occurs when electrical noise from an external source affects an electromagnetic circuit and disrupts the performance of the circuit, resulting in audio (e.g., radio) or visual (e.g., television) static. EMI/RFI can occur from natural sources, such as lightning or cosmic noise, from man-made sources, such as frayed or corroded wires, or from intentional sources, such as radio jamming. For military personnel in theater, these effects can prove devastating.

To combat these issues and support the growing electromagnetic mission for the military, the Electromagnetic Interference Test Facility, or EMITF, was established at the U.S. Army Aberdeen Test Center (ATC) in 1968. EMITF delivers state-of-the-art testing of equipment and vehicle systems and subsystems against controlled electromagnetic military standards.

Over the years, the number of EMITF test chambers has grown from one to (soon to be) four, including a new automotive dynamometer test chamber. These anechoic (free

from echo), climate-controlled test chambers electrically isolate a test system from the outside world and simulate free space. EMITF creates an environment without electrical noise or obstructions, so that accurate

Despite the efforts of the Federal Communications Commission (FCC) to regulate intrusive radio frequency interference, difficulties persist. "Or to rephrase, things go bzzt-baba-bzzt-baba-bzzzzzzt."

-Glenn Derene, *Popular Mechanics*, 10 March 2011

measurements can be made of an electrical and magnetic force or an electrical current effect.

Chamber A, soon to be operational, will house a one-of-a-kind automotive dynamometer to test vehicles realistically under load. The chamber will accommodate a vehicle with up to four axles and weighing up to 40 tons.

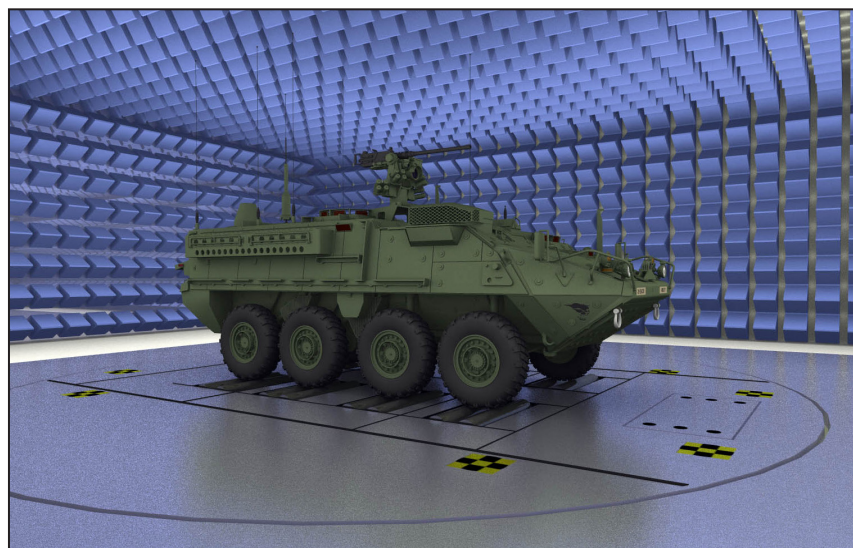
Chamber B is large enough to test an M1A2 tank, a Maxx Pro Dash armored fighting vehicle or a tractor-trailer.

Chamber C was designed to test small vehicles/equipment that can be accommodated by the 35- by 35- by 15-ft space.

Chamber D was designed to test instrumentation developed by ATC's Test Technology Directorate.

The primary mission of EMITF is to test the radio frequency performance of military vehicles and equipment by addressing these questions: Will the radio frequency emissions produced by the test instrumentation degrade the performance of a vehicle or piece of equipment that is in proximity? Will the test vehicle or equipment be negatively affected by the radio frequency environment it will confront in theater?

By providing leadership in strengthening the defense of the U.S. communications infrastructure, the FCC works toward the goal of accessible communications for all U.S. citizens. Likewise, the ultimate goal of EMITF's testing is to enable our Soldiers and Marines to complete their mission safely and effectively.



Concept image of Chamber A containing a Stryker vehicle

ATC Innovates to Combat Ever-Evolving Threats to Aircraft



Aircraft Explosive Testing Simulator

Matthew Ghent

Mechanical Engineer, Threat Detection and Systems Survivability Branch, Survivability/Lethality Directorate

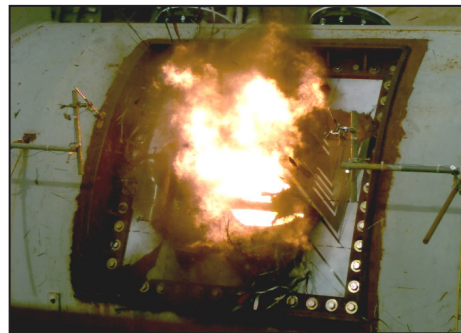
Protecting our nation's skies remains a major undertaking in today's ever-changing threat environment.

Although most commercial airline passengers think of airport transportation security in terms of baggage scanners and pat-down screenings, extensive research and testing occur behind the scenes. For example, determining what threat the scanning technologies must detect, on passengers or inside luggage, requires understanding the impact of that threat on the wide variety of commercial aircraft designs. To gather this information, the Aircraft Explosive Testing Simulator, developed for the Department of Homeland Security (DHS) by the U.S. Army Aberdeen Test Center (ATC), supports commercial aircraft explosive vulnerability testing for DHS's Science and Technology Directorate Homeland Security Advanced Research Projects Agency Explosives Division.

Most current commercial aircraft feature aluminum construction for wings and fuselage; considerable explosive vulnerability testing has been conducted on this aircraft type. However, newer generations of commercial passenger aircraft use composite materials, including carbon

fiber reinforced plastic (CFRP), for key structural elements (e.g., fuselage), and testing is under way at ATC to characterize the blast response of those new materials and structures to internal explosive threats. Limited availability and prohibitive costs of new-generation, composite-construction commercial aircraft preclude full-scale composite airframe testing, however, so an alternative test method was needed.

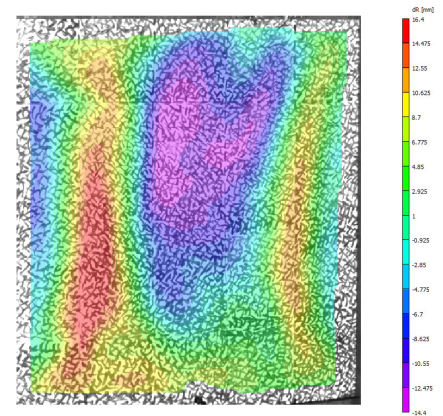
ATC is currently testing representative composite panels developed, fabricated and provided to DHS by



Composite panel explosive testing

the Federal Aviation Administration's Center of Excellence for Composite Materials Technology (National Institute for Aviation Research). The panels undergo live fire explosive vulnerability testing in an aircraft fuselage simulator created from a modified railroad tank car. The simulator features an adapter used to install the panels, allowing the simulator to be

pressurized to simulate commercial aircraft cruise altitude conditions. An explosive threat is placed inside the simulator, which is then pressurized to mimic the pressure differential of an aircraft in flight. Upon threat detonation, gauges measure blast overpressure, and high speed video and digital image correlation document panel response information. After the



Digital image correlation from panel test

simulator is depressurized and vented, post-blast inspection and analysis are performed to determine the panel blast loading response and failure mode. The panel is then removed from the simulator and replaced by a new one.

Simulator testing allows cost-efficient study of the fuselage skin of composite commercial aircraft, at normal cruise altitudes, with regard to internal blast response. This testing not only advances the knowledge of the impact of blast loading on CFRP materials and underlying aircraft structures, it also produces data to compare with that from previous testing on aluminum aircraft structural elements. The DOD's Army Research Laboratory Weapon and Materials Research Directorate also uses the data to calibrate, validate and develop numerical analysis models and tools to simulate more complex scenarios as terrorism threats evolve.

So, next time you put your carry-on bag into a luggage scanner or feel frustrated by airport security procedures, remember that it's a small sacrifice to ensure the safety of our skies.

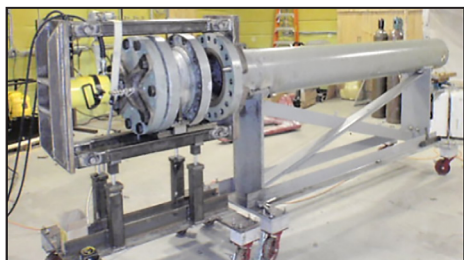
The SHOCKING Truth about High Pressure Blast Wave Testing at ATC

Jared Gardner

*Mechanical Engineer/Test Officer,
Special Projects Team, Protective
Equipment Division, Firepower
Directorate*

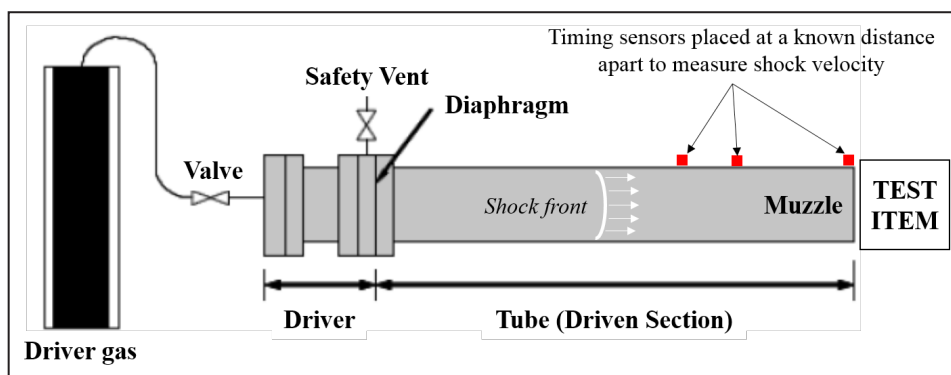
The modern U.S. military has benefited from major improvements in body armor protection over the past decade. Body armor reduces injuries from blast driven debris and shrapnel, and it saves many lives that in earlier years would have been lost. Increased body armor resistance to fragmentation has spurred testing that focuses on protection from blast-induced injuries to the chest and head. The U.S. Army Aberdeen Test Center (ATC) has upgraded its capabilities for controlled methods of blast testing using shock tubes to better understand the effects of high-pressure blast waves on military personnel and equipment.

ATC's blast simulation facility tests items by simulating free-field conditions (i.e., situations that blast waves form in open space without surfaces with which the waves can interact). The facility, located on Range 18 of Spesut- ie Island on Aberdeen Proving Ground, has two compressed-gas-driven shock tubes. The original shock tube has a 12-inch open-end barrel that can generate peak pressures exceeding 100 psi,



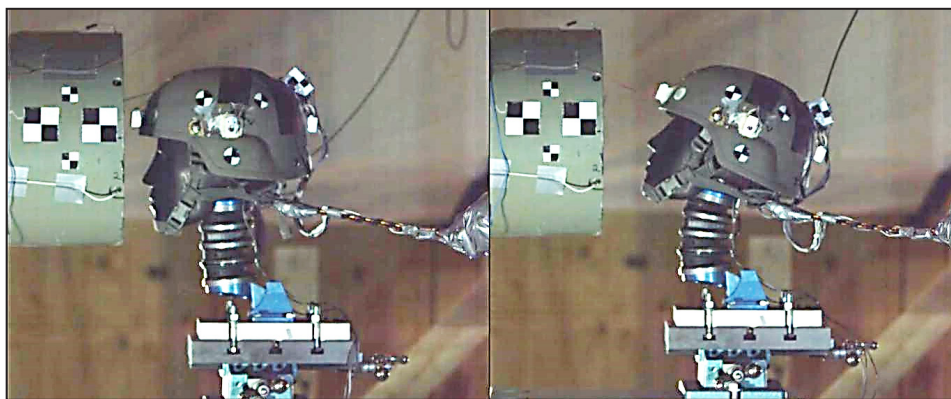
The 12-inch open-end shock tube

which is sufficient for indoor testing of relatively small items, such as mannequins of the human head. The new, 28-inch square, closed-section shock tube generates peak pressures of around 30 psi. It allows larger items, such as a torso mannequin, to be placed in the tube in various configurations for increased exposure to the blast wave without dissipation.



A simplified operational schematic of an open-end compressed-gas-driven shock tube

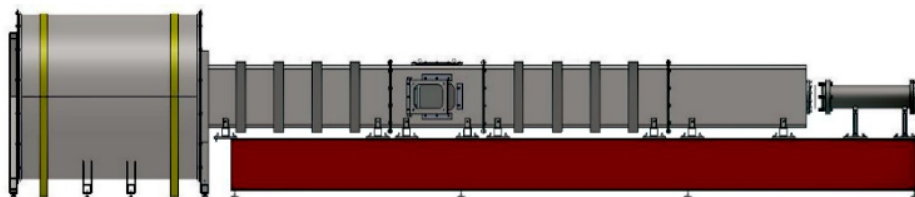
Compressed-gas-driven shock tubes are relatively simple to operate. Gas pressurizes a small chamber, called the driver, located at one end of the tube. The driver is separated at a breach from the rest of the tube, where a frangible Mylar diaphragm is inserted. The diaphragm expands as pressure in the driver builds, until the diaphragm bursts and a shock wave is sent down the tube toward the test item.



Helmet testing with the 12-inch open-end shock tube using a Hybrid III anthropomorphic test device head form.

High throughput, low cost, safe operation, and controlled testing conditions make ATC's blast simulation (shock tube) test facility ideal for a multitude of applications in the simulation of free-field blasts. Data obtained from shock tube testing also supplements free-field blast testing of anthropomorphic test dummies because of the controlled testing conditions.

Along with a newly remodeled control building and communication infrastructure, the blast simulation test facility's on-site 3-D printing capabilities enhance operations and support innovative blast and ballistic testing at ATC. Much like improvised explosive devices are becoming ever larger, ATC's shock tube test capability is developing ever more sophisticated methods to support the mission and protection of our military personnel.



Computer-aided-design schematic of the 28-inch-square closed test section shock tube

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between these two arenas. "We've up-armored vehicles and we've added and changed the technology of what we wear. That in itself has been tremendous in protecting our Soldiers and warriors."

"When you...combine that with some of the medical technology when someone is injured, it's not necessarily a decrease in injuries but it's more [that] we're surviving things, and people are living lives we never would have anticipated thirty years ago."

As a woman in a leadership role, Holcomb is pleased to see a decline in Sexual Harassment/Assault Response & Prevention (SHARP) violations.

"It's been very low," she says. "I think the environment is much better, [so that] if somebody reports something, the unit is taking immediate action to help the victim."

But despite Holcomb's position of leadership, she remains a nurse to the core.

"All [patients] require care and compassion. All require anticipation of what's next so that when the patient gets there you're already starting to think about discharge and how you're going to help the family through that. I tell my nurses, 'You're leading through change for this family. You're leading through a very stressful environment. You're seeing people at their worst, so you have to be at your best.'"

Building a Culture of Respect for One Another

When Monique Ferrell, director of the U.S. Army's SHARP program, received a coin of excellence following her presentation as the featured speaker at ATC's Women in Leadership Session in May 2018, it was a sign of appreciation for more than six years of dedicated work.

But she's far from finished.

"The people who are most passionate about the subject and caring about

the victims, they are the ones who do best," she says. "So if there's anyone who's interested in doing this work, first of all I will tell them that this is not an easy job."



Ms. Monique Ferrell

Ferrell, a native of the U.S. Virgin Islands who previously served 29 years with the U.S. Army Audit Agency as deputy auditor general, is hard at work on the Mind's Eye II program – an interactive, trust-building program designed to strengthen a unit's culture into one that values respect for one another.

"I really have to temper my excitement about it, because it really is phenomenal training, and it's non-traditional SHARP training," she enthuses. "And the fact that we have a responsibility to check on each other, and correct each other. Because if we correct behaviors before they get to the far end of the spectrum, we're in a much better place."

"We're really trying to focus on getting to the prevention side," she says of her efforts. "[Trainees] need to be willing to learn about what prevention looks like. What is primary prevention, and what is secondary prevention, and what is tertiary prevention, and how can they work with their command teams to have a climate where there are fewer of these incidents happening. As much as we have a vision that we'll have an

Army free of sexual harassment and sexual assault, the reality is that we bring over a hundred thousand new people into our formation every year. They come from all walks of life with various value systems."

Contractors are also on Ferrell's radar, as well as Army Reserve and the Army National Guard.

"My priority right now is our Department of the Army civilians because our program did not totally address [them]," she says. "The civilians didn't feel like it resonated with them because it was so Soldier-focused. So, we've been working on trying to 'civilian-ize' the SHARP program."

"The next push, honestly, will be for family members, because it applies to family members over the age of eighteen."

Ferrell's goals lie in education, and compassion for victims of abuse or harassment. Empowerment is key to this.

"Because you're worried about giving them back the power that was taken away from them. So they must be in control of everything. But the fact that they know that you care, and that you're there when they need you, and that you're supportive, and that you are doing everything that's in their best interests. That's what's most important to a victim in their time of need."

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leadership. In order to achieve gender parity, we need women who are trained, willing and able to take leadership positions. The WIL series has shown over the years that there are strong, committed, purpose-driven women who excel in a variety of capacities.

The program is continually seeking insightful speakers. Contact Reygan Freney, reygan.m.freney.civ@mail.mil, with your recommendations.

ROADEO, From page 8

in time for the holidays.

In addition, last April marked the third annual Safety Awareness Week: ATC's week-long initiative consisting of numerous training courses and events all across the test center. This year, six external vendors and three internal trainers supported this activity, providing in-depth lunch-time classes and demonstrations on

topics like ergonomics, lead awareness, fall protection, boating safety and car seat installation. The culminating event for this year's Safety Awareness Week was a Safety Expo and ATC FIT run/walk at Munson Test Area. ATC's Motorcycle Safety Mentor, the Chesapeake Region Safety Council and several local safety service vendors set up interactive booths on topics applicable to our workforce. The walk/run around the

Munson course capped off a valuable and successful week for ATC!

Each day, all areas of ATC drive home the directive to fight safety complacency. In support, the Safety and Occupational Health Office keeps rounding up fresh, impactful ways to drive home the message that --- with safety awareness --- it's not our "first rodeo" and it won't be our last!



Safety officers verified that each team operated their vehicle safely and accurately.



Silly image with a serious message - driving a trike with "drunk goggles" shows the danger of impaired driving.



ATC's Mark Stern displays exquisite form while wearing impaired driving goggles at the bean-bag toss.



COL Bodrick and Safety Officer Graham Walker prepare to award the coveted Golden Steering Wheel trophy to the Automotive Directorate.



Maryland State Troopers were on hand to discuss driving laws and highway safety.



Good preventive maintenance practice was one of the challenges in the Safety Rodeo.



A display provided by Maryland's KISS program demonstrates how temperatures can rise quickly in closed cars.

SADDLE UP FOR THE SAFETY ROADEO!

Jordan Frye

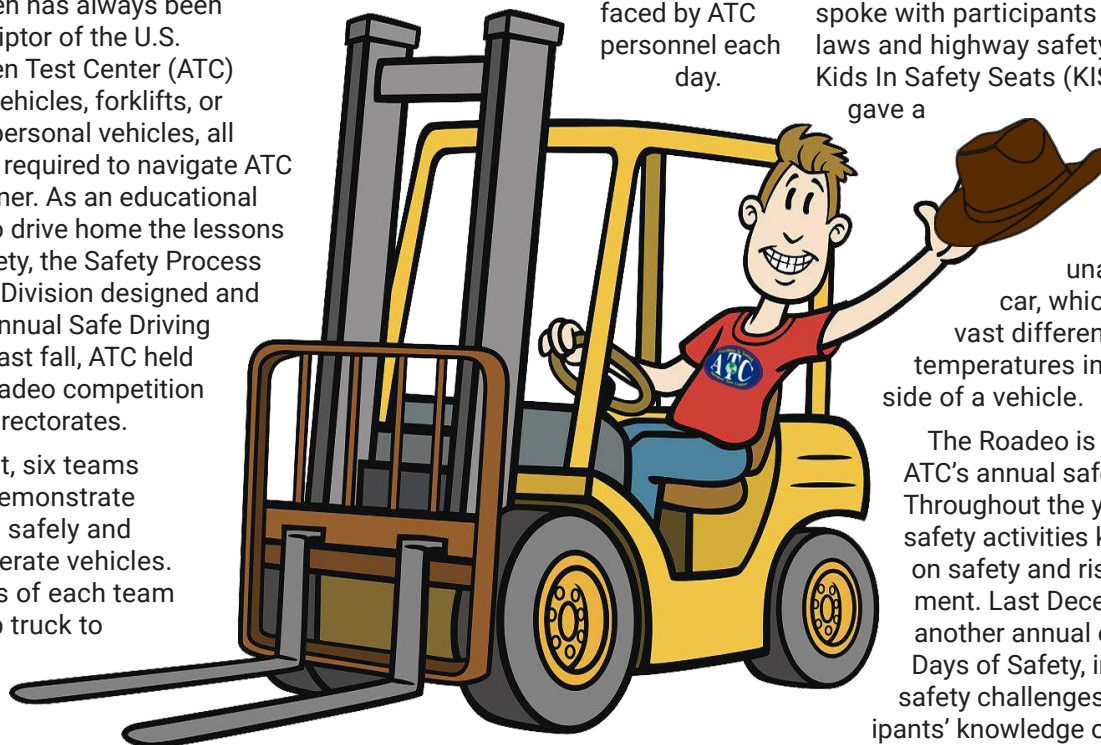
Safety and Occupational Health
Specialist, Safety Process
Improvement Division, Safety and
Occupational Health Office, Office of
the Commander

**"This ain't my first time at the rodeo."
--Faye Dunaway as Joan Crawford, in
"Mommie Dearest"**

Safety-Driven has always been a prime descriptor of the U.S. Army Aberdeen Test Center (ATC) — in tactical vehicles, forklifts, or government/personal vehicles, all personnel are required to navigate ATC in a safe manner. As an educational but fun way to drive home the lessons of vehicle safety, the Safety Process Improvement Division designed and initiated the annual Safe Driving Rodeo, and last fall, ATC held its second Rodeo competition between its directorates.

In one event, six teams gathered to demonstrate their ability to safely and effectively operate vehicles. Two members of each team used a pickup truck to carefully traverse a short, cone-lined course that was fraught with sharp turns, backing and braking challenges. At the same time, two other team members completed preventive maintenance on a separate vehicle and identified

various safety deficiencies. In a new addition to the Rodeo, the last two members of each team had to use a forklift to safely and correctly secure a load to a pallet and place it in the bed of the pickup truck. Each team was scored using a standardized points system that accounted for safety, accuracy, correctness and efficiency. These skill tests represented common tasks and demands faced by ATC personnel each day.



The Automotive Directorate team earned the highest score and took home the coveted Golden Steering Wheel this year, narrowly edging out the Survivability/Lethality and Firepower teams.

In addition to the competition, the Rodeo included interactive displays and presentations around the driving course for everyone to enjoy. The Garrison Alcohol and Substance Abuse Program provided information on drunk driving and supplied a "drunk goggles" tricycle course. A Safety Office representative explained on-road cycling safety at a display of all the gear and tools needed for safe biking. Maryland State Police troopers spoke with participants about driving laws and highway safety. Maryland's Kids In Safety Seats (KISS) program gave a demonstration on the dangers of leaving a child unattended in a car, which showed the vast differences between temperatures inside and outside of a vehicle.

The Rodeo is just one of ATC's annual safety initiatives. Throughout the year, other safety activities keep the focus on safety and risk management. Last December began another annual event, the 12 Days of Safety, in which 12 safety challenges tested participants' knowledge of home and work safety. For each topic, an interactive station was set up with a multiple-choice question. Each correct answer earned the participant one ticket that was entered into a prize drawing. Six lucky contestants took home prizes

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Thank you to everyone who contributed to this edition of The Point Position.