



ABERDEEN TEST CENTER

THE POINT POSITION



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The State of Our Command: "Army Strong"!

Col. Morris L. Bodrick
Commander, U.S. Army Aberdeen Test Center

On May 5, 2016, at the ATC Annual State of Command, I had the opportunity to address the entire workforce and reflect on the past year's accomplishments, challenges and way ahead. This year's theme, "Proud of Our Past, Focused on Our Future," was vitally important as we prepare to celebrate 100 years of testing at Aberdeen Proving Ground, where over a billion rounds have been fired and millions of miles driven. My message to the workforce focused on the importance of what they do. It's not often we get a chance to reconnect a Soldier with a piece of equipment that saved his or her life but that's what we had the opportunity to do for SSgt. Thalamus Lewis. SSgt. Lewis, who was struck in his helmet while on patrol in theater and survived, was reconnected with that piece of equipment that saved

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Test, Fix, Test - Truth in Testing: A Talk With ATEC's Commander

Maj. Gen. Daniel Karbler, Commanding General, U.S. Army Test and Evaluation Command (ATEC), was interviewed by Christina McClung, ATC Point Position Staffer.

Soldiers load a military truck, head into the desert on night ops and take it for granted...the vehicle works.

The brakes brake. The steering

steers. Seat belts keep them from flying through the windshield.

They just work...

No...the vehicle works because somebody, somewhere, has tested every component. Their lives depend on it.

In combat, a Soldier relies on

everything he or she touches, from boots, to tanks, to weapons...including the kitchen sink!

Testing to protect the men and women who defend our country is the sole mission of ATEC, overseeing eight subordinate organizations, employing

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Major General Daniel Karbler

Soldier Tours ATC After Receiving Life-Saving Helmet

Louise C. Spangler

Chief, Protective Equipment Division,
Firepower Directorate

Machin-gun fire impacts a Soldier's helmet, causing a mere abrasion.

Soldier gets closure by receiving the protective equipment that saved his life.

On October 4, 2012, while assigned to 41st Engineer Company, 1st Engineer Battalion, Forward Operating Base Airborne Afghanistan, Staff Sgt. Thalamus Lewis received sustained machin-gun fire while on a dismounted route clearance patrol. A single bullet struck him on his Advanced Combat Helmet (ACH), and Lewis sustained forehead abrasions about 1 inch above his right eye.



Staff Sgt. Thalamus Lewis stands next to an Advanced Combat Helmet being tested at ATC's Light Armor Range Complex.

Lewis' personal protective equipment (PPE) was retrieved by the Operation Enduring Freedom (OEF) PPE Battle Damage

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ATC Helps Homeland Security Ensure Safe Flight

Matthew G. Ghent

Test Officer, Threat Detection and Systems Survivability Branch, Survivability/Lethality Directorate

Terrorists can make explosives undetectable by all but the most intrusive searches.

Aviation security is critical to our defense against terrorism.

ATC works with Homeland Security to identify threats and countermeasures.

Each day, aviation security impacts millions of commercial airline passengers. Terrorism remains an ever-changing threat, and protecting the current and future fleets of commercial aircraft requires the collaboration of organizations across the country.

Since well before 9/11, ATC has supported the Commercial Aircraft Vulnerability and Mitigation Program, which is now sponsored by the Science and Technology

aircraft to terrorist-based internal explosive threats and establish countermeasures against cataclysmic structural failure

resulting from those threats. Testing is performed in two main areas.

Explosive Mitigation testing focuses on developing technologies to mitigate catastrophic explosive damage, such as explosive shock, blast overpressure, fragmentation and fire. ATC has performed live-fire testing on a variety of commercial aircraft blast-mitigation techniques, including blast-resistant aircraft

Commercial Aircraft Vulnerability testing addresses the ability of commercial aircraft to survive internal explosive detonations in the passenger cabin and cargo holds. At ATC, testing is performed on both jet and full-scale aircraft.



Blast-resistant baggage/cargo container design test in process.

The central issue is determining the minimal size threshold for an explosive to cause immediate catastrophic aircraft loss. The test data is used to establish performance standards for the screening technologies used in airport checkpoints, upgrade future aircraft design, and develop technologies to reduce aircraft vulnerability to explosives. These improvements help to ensure that potentially disastrous terrorist acts do not result in the loss of the aircraft.

ATC also supports basic research on various types of explosives, both standard and homemade. As a Major Range and Test Facility Base, ATC provides the DHS Science and Technology Directorate with the scientific, engineering and test resources and capabilities of the DOD. Through their collaborative effort with ATC, DHS can leverage existing resources to innovate the technological tools to protect the homeland.



DC-10 jet airliner undergoing vulnerability testing at ATC's Phillips Army Airfield.

Directorate of the Department of Homeland Security, known as DHS. The program's overarching goal is to identify the vulnerability of commercial

baggage/cargo containers, explosive-resistant aircraft passenger cabin and cargo hold liners, and hardened overhead stowage bins.

Shell Collecting

With a Vengeance:

The Ocean's Impact on the Burial, Exposure and Movement of Old Military Ordnance on Our Beaches

Gene L. Fabian

Test Officer, Threat Detection & Systems Survivability Branch,
Survivability/Lethality Directorate

World War II military ordnance has washed up on the beaches of several U.S. coastline states.

Soil erosion on mid-Atlantic beaches exacerbates the problem of munitions washing up on beaches.

ATC is testing to find the safest ways to recover ordnance from our coastlines.

Bombshells on the beach typically don't carry sinister connotations as vacationers escape the summer heat at nearby shores. However, one does not need to dig deep on the Internet to find reports of unexploded military ordnance routinely washing up on beaches along the East Coast.

Given recent environmental considerations, the idea of offshore disposal of excess military ordnance is perplexing, but the practice was authorized between 1919 and 1970. In 1972, the Marine Protection, Research and Sanctuaries Act was signed into law, and cleanup has been prioritized. Since then, the U.S. Army Corps of Engineers has

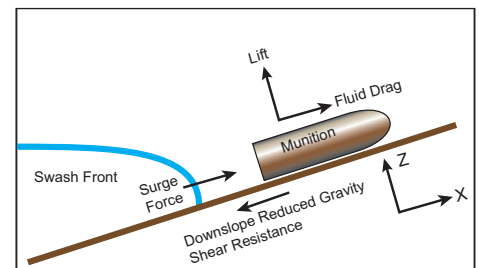
identified hundreds of locations within formerly used defense sites that contain discarded military munitions and unexploded



ATC's explosive ordnance disposal team detonates a World War II bomb off the shore of Assateague Island. Photo courtesy of Maryland Coast Dispatch.

ordnance, known as UXO, in the underwater environment. Live artillery shells, projectiles, bombs, mines and grenades more than 70 years old have been recovered, posing the risk to the public of UXO detonation or exposure to toxic chemical agents.

Recovery of underwater munitions, however, can be even more dangerous than leaving them in place, as many have deteriorated from long-term exposure to the elements. ATC is supporting a research team from the University of Delaware Center for Applied



Schematic of the forces acting on a munition on a beach face.

Coastal Research (UD-CACR), led by Dr. Jack Puleo, on an unprecedented project to determine the impact of ocean water movement (velocity,

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Finding a Safe Balance



A Medium Tactical Vehicle Replacement (MTVR) performs a NATO double lane change at the Perryman Test Area A course.

Brian S. Hill

Chief, Automotive Instrumentation Division, Automotive Directorate

Military personnel need continually improved equipment.

ATC testing takes vehicles to the point of no return...and back.

As ATC test professionals, we are often asked why we are still testing Humvees, Abrams tanks and other systems that have been used in the field for decades. Why do they need to climb the slopes again? Why do we keep doing brake stops? What most people do not realize is that those systems are constantly updated, improved or reengineered to improve their reliability and usefulness for our Soldiers. Each modification changes the vehicles, sometimes drastically, with up-armor kits, more powerful engines, larger payload capacities and so on. If the vehicle will be used in a risky tactical or combat situation, its performance must be fully understood before it is sent to the troops. A truck driven in a convoy at 70 mph in theater must be able to stop quickly, swerve at a moment's notice and not overheat while climbing mountains.

The Automotive Instrumentation Division specializes in testing these systems, and the most aggressive exercises performed may be steering

and handling maneuvers. These tests use state-of-the-art instrumentation packages to measure parameters, and the vehicles are fitted with outriggers for safety. Outriggers are designed in-house with the Instrumentation Development Division and then fabricated by the Experimental Fabrication Division. Each set is custom built and scalable, with movable weight sets to mimic any payload the vehicle might be required to handle in the field.

Sine-with-dwell maneuver testing has been performed on all commercial vehicles sold after September 2011. The test involves accelerating the vehicle to approximately 50 mph with no steering or braking, coasting in the highest gear and robotically applying a steering control to create a dramatic steering maneuver. The roll angle of the vehicle is measured to determine whether it passed or failed the test. Currently, each new commercial vehicle is equipped with an electronic stability control system.

In military vehicle testing, outriggers are needed to perform aggressive automotive tests that push a vehicle

past its design limits while mitigating risk to the operator and vehicle. During high-speed steering maneuvers, any vehicle will eventually reach a point of instability. If this condition is not corrected quickly, the vehicle will roll over. Outriggers prevent that catastrophe from damaging man or machine. Before an outrigger-equipped vehicle arrives at the ATC test course, the outriggers are stringently tested to determine if they can withstand the planned test loads.

Also, extensive engineering analysis is done to determine the centers of gravity for each test condition, and the vehicle is tested on ATC's Tilt Table to determine its threshold for static rollover.

After a vehicle is tested in various configurations, the pertinent data is forwarded to evaluators and program managers to facilitate decisions on



An MTVR with outriggers undergoes a sine-with-dwell test at Phillips Army Airfield.

vehicle safety and fielding. Frequently, the test results will lead to changes in how vehicles are tactically deployed in the real world. Speed limitations, payload alterations, and safe and effective following distances are some of the areas in which our test data makes a difference. The end result: safer and more robust and reliable vehicles that help our Soldiers fulfill their missions.

Together in Testing



Soldiers test the limits of a combat vehicle to experience how it performs on rough cross-country terrain.

Wade C. Harvey, Test Officer

Wayne T. Strine, Chief

Combat Vehicles Division, Automotive Directorate

ATC performs hundreds of test activities daily.

Soldiers are active test participants, bringing specialized experience to the process.

At Aberdeen Test Center each day, civilians test combat vehicles and related equipment that will ultimately be

provided to U.S. Soldiers. Test personnel spend months, sometimes years, thoroughly testing system mobility, weapon performance, reliability, safety, human factors, environmental performance and electromagnetic effects. Combat vehicles are especially complex because

they integrate many subsystems - automotive, weapons, electrical, communication, navigation and much more.

ATC has decades of experience testing complex systems in controlled environments, but integrating humans into the mix is much more difficult. ATC testers are highly trained and experienced in the field of combat vehicle operations, and the Soldiers who use the systems have insight that is invaluable to the testing process. For that reason, it is important to include Soldier assessments early in any major test program. The perspective that Soldiers bring to a test can help identify issues with equipment and vehicles that perform well in a controlled environment but may not necessarily do so in the field.

Currently, a group of Soldiers assigned to ATC form an integral part of test teams on a variety of

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LEWIS, From page 1

Collection Team. Analysis showed two partial penetrations: one on the left side of the ACH and one on the front center edge.

The wounded Soldier never thought he'd again see the helmet that saved his life. "I was hoping for it, and as the years went on, it got quiet; and then all of the sudden I got an email out of the blue and I was like, 'Yes, of course I'd like it back,' and they started the process to get me and my family up here."

"Here" was Aberdeen Test Center. Lewis visited ATC on April 20, for a Program Executive Office Soldier (PEO Soldier) Warrior Recognition Event. In a ceremony at Fort Belvoir on April 19, Brig. Gen. Brian P. Cummings, PEO Soldier's program executive officer, presented Lewis with the plaque-mounted helmet that saved Lewis' life during OEF. The event was part of the Protective Equipment Return Award Program, which began in 2013 in response to Soldier requests for return of life-saving equipment. "It is closure," said Col. Dean M. Hoffman IV, Soldier Protection and Individual Equipment project manager. "It's healing for that Soldier to see the piece of equipment that saved his life."

Before the presentation, PEO Soldier held a Media Round Table on development, production and fielding of Soldier PPE. Panel member Charles D. Valz, director,

Firepower Directorate, ATC, commented that annually, ATC tests more than 700 lots of PPE, equating to more than 9,000 subtests, approximately 71,000 rounds



SSgt. Lewis says he will give the life-saving helmet to his mother, Mrs. Cynthia Boggan, here being greeted by ATC Commander Col. Morris Bodrick.

fired and nearly one million pieces of body armor fielded. Valz described the ceremony as "a testament to the one goal for all involved with the research, design, testing and acquisition of personal protective equipment—saving Soldier's lives."

Lewis and his family, and his Platoon Leader and his wife, Capt. and Mrs. Dillon, were escorted through the Army Research Laboratory (ARL), and then ATC, where Lewis' helmet was developed and tested. They saw various helmet research efforts, including a project initiated by the National Football League to create helmets providing better protection for football players and Soldiers.

At ATC's Light Armor Range Complex (LARC), the group received an overview of body armor testing. On display were a helmet similar to that of Lewis' and an ACH with Gen II helmet sensor, which in theater gathers blast overpressure and acceleration data that is downloaded at wireless checkpoints for head and brain injury research.

Col. Morris Bodrick, ATC Commander, presented Lewis with a framed photo montage from his time at LARC. Lewis and the other visitors each received an ATC Coin. Col. Bodrick closed with words of appreciation for Lewis' service and dedication.

Lewis is stationed with the Headquarters Battalion and 3rd Infantry Division Headquarters at Fort Stewart, Georgia. After more than 19 years in the Army, he plans to retire this summer.

And the helmet? "My Mom's going to keep it," he said with a laugh. "She's already told me."

KARBLER, From page 1

8,100 Army civilians, contractors and military personnel to test everything the Soldier wears, drives, eats and shoots... even the field kitchens.

ATC is one of those organizations, employing nearly 1,300.

"Testing is not just a check the box along the conveyor belt of the acquisition timeline," explained Maj. Gen. Daniel Karbler, ATEC Commanding General, in an exclusive Point Position interview.

Sometimes the process is "test... fix....test."

Often an item is submitted for testing with the assumption that "it's just going to pass right away with flying colors right from the start," Karbler said.

In testing an item, there is always the possibility that "it might fail, there might be a design problem, there might be a manufacturing problem. There just might be something wrong with whatever we're testing...and back to the drawing board to fix that, so

then we can retest it to make sure it will be ok to operate."

Fiscal constraints have had a significant impact on testers, according to the West Point Graduate.

"Nobody wants to fail and go back, because that's going to be more time and more cost to the program.



"What we try to do is stay flexible in our test and evaluation. We try to identify problems as early as possible up front, with the program managers."

By anticipating testing issues, ATEC can help program managers to, as Karbler said, "make sure they ac-

count for the fact that their program might have to go back and redo some things. So build that into the schedule up front, so that they don't hurt themselves trying to play catch-up at the end."

An Air Missile Defense Officer, Maj. Gen. Karbler has served in Europe, Israel, Saudi Arabia, Qatar and at the Pentagon.

"My Patriot Battalion, and other Patriot Units I've been in, have undergone operational tests," he said with a smile. "I joke that I've been a crash test dummy before, but I've never been the one applying the test and evaluation.

"At the end of the day, I can feel very confident that what the Soldier will get is going to work. But also, that what the American taxpayers are paying for is not going to be a waste of money.

"I want to tell all the ATC Teammates: Thanks very much for what you do every day to provide effective, suitable, survivable and safe equipment to our Soldiers."

See the interview at www.atc.army.mil

TOGETHER, From page 5

platforms. Occasionally, ATC also hosts Soldiers from all over the world to test alongside us. They experience prototype equipment firsthand and provide valuable feedback to support system evaluations. Just like civilian testers, Soldiers help assess automotive and weapon systems characteristics to provide operational feedback to decision makers. If the

Soldiers are involved early enough in the acquisition cycle, their feedback can support critical modifications to system design, tactics and procedures. Those changes improve the suitability, performance and safety of the equipment and vehicles they will one day use in the field. Not only does that benefit Soldiers, but early feedback and improvements can save the Army millions of dollars, as major

alterations made late in the process can be extremely costly.

The U.S. Army Test and Evaluation Command (ATEC) and ATC are proud to have Soldiers both as part of our daily test teams and as visiting participants. Their contributions are invaluable to the entire acquisition process. After all, they are *the ultimate customers!*

HISTORY, From page 8

The Maryland Conservation Commission launched an investigation, concluding that the chemicals from the bombs dropped in 1923 were the cause. The Army detailed Soldiers to patrol the shores in boats, shooing away any ducks that attempted to land, as well as depositing mud and silt over the contaminated areas.

Incidents such as these made APG

more aware of the effects that proof testing and the construction of facilities had on the surrounding community and environment. To combat negative effects, the Civilian Conservation Corps was utilized in July 1935. Several hundred men were employed to take on a number of projects to benefit the Proving Ground, as well as the environment. The Corps took on shore erosion work; drainage work at test courses; construction of firebreaks; clearing of

brush, poisonous weeds and shrubs; planting of trees; and ditching of marshland. APG's extensive acreage became an informal reservation. Hunting was limited in the hopes that the area would become a game preserve. These projects initiated the transformation of the Proving Ground from the flat, treeless farmland which the Army had first purchased, to the richly wooded expanse that endures today.

Continued next issue

SHELLS, *From page 3*

shear stress, turbulence and surge) on munitions movement (burial, exposure, transport) on the beach face—the sloped portion exposed to the swash of waves.



The Littoral Warfare Environment can generate wave action that accurately mimics surf conditions.

The size, shape and weight of munitions also affect mobility. Several surrogate and inert munitions of varying sizes and shapes will be tested. The research team will take detailed, time-series measurements of wave forcing and movement on the beach face in the swash zone—the beach area that is intermittently submerged. Technologies such as overhead, side-looking and submerged camera imagery; GPS; ultra-wideband surveys; and current meters will be used. The study results will provide more information on the hydrodynamic forces that control munitions movement and on the safest ways to remove or neutralize the unexploded ordnance.

ATC's Littoral Warfare Environment outdoor wave flume will be the site of initial pilot testing under low- and high-energy wave conditions. Afterward, UD-CACR researchers will perform tests under the same wave conditions on shallow and steep sloping beaches

in Delaware and New Jersey. The study group will use the data to determine which factors control the fate of discarded munitions and UXO on the beach face: Will they become buried or unburied? Will they transport or remain fixed

in place? Ultimately, the results will help restore public safety along coastal areas burdened with discarded military ordnance.

ARMY STRONG, *From page 1*

his life. SSgt. Lewis had the opportunity to bring his family to ATC and meet the people that ensured that piece of equipment was safe, suitable and survivable. These efforts assure that the SSgt. Lewis and the rest of our Armed Forces have the best equipment available to engage our enemies around the world.

ATC is a one of a kind asset to our nation. We are not very big in size, but the mission we embark on every day tells a different story. We have 66,000 acres of outdoor laboratory, located in a unique part of the country that represents 80% of the world's climates and allows us to provide comprehensive test data vital to making critical acquisition decisions. This means that when Soldiers use equipment tested at ATC, they know it has been tested to the highest standard.

We have a long history of testing for

the Armed Forces, and this past year we have been very busy. We conducted testing to support the fielding of 600,000 pieces of body armor, drove 126,941 miles on our test tracks, fired 1,765,816 rounds and fabricated equipment using 750,000 feet of welds.

This critical work would not be possible without the teamwork of our military, civilian and contractor personnel. ATC is very fortunate to be the only developmental test center with a supported Soldier operator-maintainer testing and evaluation (SOMTE) program. We are able to provide and leverage early Soldier operational test feedback during developmental testing. So far in FY16, SOMTEs have supported testing on 21 programs, enabling programs to make changes to systems much earlier in the process, improving the usability of systems once they are fielded and reducing acquisition cost. We would love to expand that influence on the test community, it's a great asset that is greatly needed.

Looking to the future, we will be focused on the Command's top five initiatives: Personnel, Resource and Management; Data Collection, Reduction and Analysis; Knowledge Management; Autonomous Robotics; and Shift Left, which involves moving some of the Soldiers involved in operational testing into developmental testing. Finally, as threats to our infrastructure and the movement of big data across our networks and tactical platforms increase, we are leaning forward with our current capabilities to ensure we are postured to provide a robust system-level cyber test capability. As we prepare for the next 10-20 years, it is these critical areas that are at the forefront of our impact on the future of national defense.

As I close out my first year in command, it has truly been one filled with great people working toward a common goal: ensuring that safe, effective and reliable equipment gets to our service members in the field. I believe we are successful when we work together. We are standing on the shoulders of those who came before us and focused on a future filled with great challenges. The State of this Command is "Army Strong."

100 Years of Excellence: The ATC Story, Part 2



Excerpted from an article by Lauren Nelson

When World War I concluded, Aberdeen Proving Ground took on a peacetime mission of research and development while the facilities and



Lt. Phillips' Handley-Page bomber.

capabilities of the proving ground expanded at a steady pace. An airfield was completed in 1923 and named Phillips Army Airfield in honor of the pilot who died in an aircraft accident at the new airfield in June of that same year. Lt. Wendell K. Phillips died on June 5, 1923, when his Handley-Page bomber broke an axle and crashed on takeoff. Phillips was able to cut off the engine of the aircraft and avoid a fire, thereby saving all five of his passengers, though Phillips died from injuries soon after the accident.

The new Phillips Army Airfield witnessed a number of famous firsts with

developments in aerial bombing. The world's first 4,000-pound bomb was dropped by Sgt. Stewart C. Smink, a bombardier who would later command the Proving Ground Squadron of the Aberdeen Air Unit as Lieutenant Colonel. Phillips Army Airfield was also the first place where dive bombing tactics were tested. In addition, the first 75-mm aircraft cannon was fired from a B-18 aircraft piloted by Capt. C.S. Thorpe on October 12, 1939.

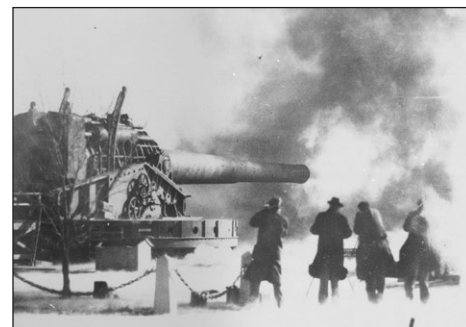
Ordnance testing of artillery and ammunition persisted, and it was during this interwar time period that the test mission of the Proof Department expanded to include automotive testing. Vehicles such as the Ford 6-ton tank, the Class B Liberty truck, and various predecessors of the World War II Jeep were tested at the Proving Ground. Construction began on an automotive test course in 1933, and vehicles



Ford Reconnaissance Car stalled during a test, December 28, 1923.

were driven on its rough roads to test for endurance and speed. Examples of the successes of vehicular testing during this time were the experiments comparing Caterpillar treads to wheels in 1931. Caterpillar treads, also called continuous tracks, were a propulsion

system using metal plates linked together in a band driven by two or more wheels. In tests conducted at the Proof Department, the Caterpillar tread was clearly superior in mechanized vehicle movement because the width of the tracks distributed the weight of the vehicle better than traditional



Firing the 16 Inch Gun on the APG Plate Range.

tires. As a result, new combat vehicles sported the improved tread. From 1919 to 1940, new materials and items were brought to APG to be studied and proofed. Powders, projectiles, bombs, rapid fire weapons, interior and exterior ballistics, railway and seacoast artillery, tanks and tractors were tested and developed. Even though the United States was at peace, it was important to keep the military well supplied and ready to face any new conflict.

Problems periodically arose when a test had an unforeseen effect on APG's environment. For example, in 1923, bombs containing phosphorous nitrate were tested by being dropped in areas of the Upper Chesapeake Bay. Two years later in 1925, hundreds of dead waterfowl were found in the water and on shore by local sportsmen.

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Commander
U.S. Army Aberdeen Test Center
400 Collieran Road
APG MD 21005-5059
<http://www.atc.army.mil>

Commander: Colonel Morris L. Bodrick
Technical Director: Mr. John R. Wallace

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Direct inquiries to: Command Staff Directorate, Management Support Division

Phone: 410.278.6164

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