Air Force
Civil Engineer
By Engineers. For Engineers.
Vol. 26 No. 2 Summer 2018

AIRMEN POWERED BY INNOVATION

HARVESTING TOMORROW'S TECHNOLOGY FOR TODAY'S WARFIGHTERS

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Look to the future

Brig. Gen John J. Allen, Jr. (U.S. Air Force photo)

To say that being selected for service as the Air Force Director of Civil Engineers is an honor, is probably an understatement of considerable proportion. The privilege of following in the footsteps of recent leaders like Tim Green, Theresa Carter and Tim Byers — each of whom guided the career field in support of our Air Force through times of great opportunity and challenge, with poise, professionalism and tireless dedication — is special to say the least. Suffice to say that I am excited to serve in this capacity, alongside the great men and women of the Air Force Civil Engineer Corps.

Like for those leaders and their times in this seat, today's operating environment is full of opportunity and challenge. These are exciting times to serve and times that will demand our very best as thinking, collaborating and problem-solving Airmen. Airmen Engineers must make a concerted effort to restore civil engineer readiness across the full spectrum of military operations, take steps to reinvigorate our civil engineer squadrons, normalize new organizational constructs and double-down on our longstanding pursuit of efficiency and innovation. In the short time I've been in this post, I've already had a chance to visit the field and see the great work Civil Engineers are doing to address each of these challenges and opportunities alike. Rest assured that we on the Air Staff will continue our work to advocate for the resources and policy that will enable you to advance the capabilities of our Air Force. In the end, the Air Force's success begins and ends with Airmen serving at our installations, and we will keep that in our cross-check every day.

As I look back on my time in the Air Force civil engineer business, I remember my first job as a summer hire working in the 401st Civil Engineering Squadron at Torrejon Air Base, Spain. I spent a lot of time cutting grass — and I got my first exposure to two truths that have stayed with me for 26 years of Air Force service. First — Air Force installations, fixed and expeditionary, are the platforms from which we provide and project air, space and cyberspace power; and the sustainment, recapitalization and protection of those installations are vital to our national defense. Second — the culture in our squadrons and across the enterprise is characterized by a commitment to our core values, strong leadership, intense pride, healthy humility and respect for one another. It is as important to our success as the resourcing, equipment and all the measurable things we do. In simpler terms, "how" we do is as important as "what" we do. We will keep development and sustainment of our civil engineer culture firmly in our cross-check, as we work to support you from the Air Staff.

Looking to the future, we must focus on the clear set of priorities from our Secretary of the Air Force and Chief of Staff of the Air Force as the center of all we do. As your new Director of Civil Engineers, I am thrilled to work with you — our world-class Airmen organized into world-class units — to get after those priorities. It will be my sincere pleasure to work alongside and in support of each of you, as we work to meet those priorities in the months and years ahead.

Engineers…Lead the way!

John J. Allen, Jr.
Brigadier General, USAF
Director of Civil Engineers

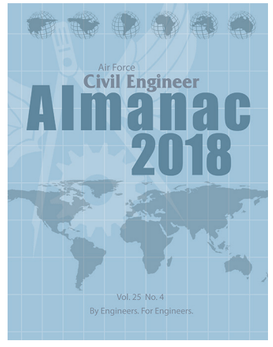
Features

Vol. 26 No. 2 Summer 2018

On the cover

MAIN PHOTO: The Air Force is using Recovery of Airbase Denied by Ordnance (RADBO) in its efforts to clear active runways and other mission-critical resources. (U.S. Air Force photo by Marshall "Doc" Dutton, AFCEC/CXD)

INSET: The Air Force is making some changes to its physical training to ensure every Airman is fit to fight. (U.S. Air Force photo by Airman Madeleine Remillard)



Where's the Almanac?

The publication of the annual CE Almanac, a compendium of who's who and what's what in the CE enterprise, has moved to the fall. This change in the publication schedule allows the Almanac to better align with staffing movements throughout the civil engineering community.

Look for the 2018 CE Almanac this fall.

Engineers...Lead the way!

Director of Civil Engineers
Brig. Gen. John J. Allen, Jr.
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Air Force
Civil Engineer
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FAREWELL **CEM/CFM Wilde**

Chief Master Sgt. John Wilde (U.S. Air Force photo)

As your Chief of Enlisted Matters (CEM) and 3E000 Civil Engineer Career Field Manager (CFM) for the past three and a half years, it has been my honor fulfilling this role and the responsibilities assigned to both positions. I have a deep appreciation and personal commitment to our 3E Airmen and have dedicated my time here at Headquarters Air Force to support the educational, training, retention and development of our 30,000 person strong Total Force Civil Engineer enterprise.

I began my Air Force career in 1988 as a Structural Specialist and over the span of 30 years have deployed multiple times to support numerous missions, to include: Operation SOUTHERN WATCH, ENDURING FREEDOM, IRAQI FREEDOM, NEW DAWN and U.S. Southern Command's NEW HORIZONS. Stationed at locations all over the world, each deployment, duty station and opportunity as a Military Training Instructor offered experiences and challenges that helped me grow as a person and Airman.

I am particularly proud of four major achievements that the CE Chiefs' Council achieved during my tenure. 1) spearheaded the RED HORSE Code-50 Initiative, placing every NCO on a five-year tour with members still eligible for Developmental Special Duty (DSD) and CE EQUAL Plus Advertised positions (e.g., Tech Training Instructor, Silver Flag cadre, staff positions, etc.), 2) worked with the Chief Master Sergeant of the Air Force to add the Airman Dorm Leader (ADL) career field to the DSD program, 3) created an Enlisted Development Vector program, where the Chiefs' Council vectored senior master sergeants and chief master sergeants into key leadership and development positions, and 4) opened CONUS civil engineer squadron superintendent positions to fire, explosive ordnance disposal and emergency management chiefs who have been vectored to lead a CE Squadron.

I greatly enjoyed my time at the Pentagon, and I am excited for what Chief Master Sgt. Randall Youngblood will accomplish in his new role as your CEM and CE CFM. He will serve this position phenomenally. Thank you and TENCH HUT!

WELCOME **CEM Youngblood**

Chief Master Sgt. Randall Youngblood (U.S. Air Force photo)

My name is Chief Master Sgt. Randall Youngblood and I am the new Chief of Enlisted Matters and Career Field Manager for the 3E000 Traditional AFSCs. I am extremely grateful to have this opportunity and have huge shoes to fill by replacing Chief Master Sgt. John Wilde. During his tenure, he has worked hard on numerous initiatives that have and will continue to enhance our Airmen for many years to come, and I look forward to continuing to improve our force.

I began my career as a Pavements Maintenance Specialist at Tinker Air Force Base, Oklahoma, and now, almost 28 years later, I have the opportunity to help improve how we organize, train and equip Civil Engineers. During my tenure as your Chief, I plan to focus my efforts on three main areas: increasing readiness, leveraging innovation and technology, and building professional engineers.

To help increase unit readiness, a couple of items we are currently developing are increasing opportunities for training on Rapid Airfield Damage Repair (RADR) equipment at various locations and enhancing Ability to Survive and Operate training at Silver Flag sites. In addition, we are looking at more opportunities for Civil Engineers to take advantage of technology and innovation. For example, our Tech School Training Managers are teaming with AFCEC Force Development Managers to look at ways of incorporating innovative technologies into tech schools so Airmen attending get more hands-on experience to better build on the foundation of becoming future craftsmen. Lastly, I will concentrate hard on establishing opportunities to help Build Professional Engineers: this will include increasing credentialing through industry-recognized certifications using the Air Force Credentialing Opportunities Online and other programs, increasing vendor training opportunities, and expanding training opportunities for enlisted engineers at the Air Force Institute of Technology.

I look forward to serving the Civil Engineer enterprise and continuing to maintain the best Air Force in the world. If you have any questions, please feel free to reach me by emailing usaf.pentagon.af-a4.mbx.a4cs-enlisted-cfm@mail.mil.

Innovations in strategy

By Col. James Downs
Chief Installations Strategy and Plans Division, AF/A4CP

Today's complex operating environment places significant demands on Airmen engineers. We must contend with unpredictable fiscal constraints, aging and excess infrastructure, human capital shortfalls and an increasingly uncertain geopolitical atmosphere. Additionally, we must be responsive to the evolving character of conflict. Our bases are no longer sanctuaries, peer adversaries are closing the gap on competitive advantages, rapid technological change is a growing opportunity and threat, and environmental effects from climate change threaten coastal and non-coastal installations alike. In order to effectively enable diverse missions across multiple domains in this dynamic context, we must refine our capabilities, capitalize on technological advancements, improve operational efficiency and, most importantly, promote a culture of innovation. To that end, Maj. Gen. Timothy S. Green charged his strategy and future concepts team to develop a unified strategic direction for the civil engineer enterprise focused on delivering the Airmen engineers and installations vital to a globally responsive joint force.

This evolution of our strategy development began in September 2017 with a series of working groups comprising participants from Headquarters Air Force (HAF), Air Force Installation and Mission Support Center (AFIMSC), Air Force Civil Engineer Center (AFCEC) and major command staffs, as well as a select group of base-level engineers. These working groups analyzed the seven capabilities that comprise the Air Force's Basing and Logistics Flight Plan, which describe the ability to achieve specific effects within the logistics, engineering and force protection communities in support of our national security strategic framework. These working groups had two specific goals: (1) identify potential gaps in our ability to achieve the strategic end states of resilient and rightsized installations and agile, innovative, and ready Airmen engineers, and (2) highlight interdependencies among Basing and Logistics Flight Plan capabilities (i.e., what Airmen engineers and installations provide to enable the success of the A4 Enterprise, and what we require from Air Force logisticians and defenders to achieve our strategic end states).

In November 2017, over 50 representatives from across the total force assembled at the Civil Engineer Enterprise Strategy Summit in Pittsburgh, Pennsylvania. This very productive and highly successful two-day event was truly integrated, with tremendous diversity of thought and transparency. Attendees joined together to consider the future operating environment, assess the essential characteristics of future installations and Airmen engineers, and identify new capability gaps, as well as evaluate the gaps previously recognized by the working groups. At the conclusion of the summit, participants had prioritized 32 potential capability gaps that would serve as the foundation for developing the Civil Engineer Annex to the Basing and Logistics Flight Plan.

To capitalize on the success of the summit, we then engaged the civil engineer enterprise governance to transform the capability gaps into strategic objectives to focus enterprise efforts for the next 10 to 15 years. With eight lines of effort aligned under our two strategic end states, the Civil Engineer Annex postures our enterprise to more readily infuse innovation into our fundamental processes and procedures. For example, smart meters currently being fielded and pilot testing of sensor capabilities are key steps to adopting other "smart-base" technologies. These advancements, however, can generate massive amounts of data that must be processed and analyzed to properly inform decisions within our enterprise and beyond. Thus, an objective in the Civil Engineer Annex speaks to leveraging data as a strategic asset to allow Airmen engineers to "operate at the speed of relevance," as mandated by Defense Secretary Jim Mattis. This objective may evolve to include the use of cognitive computing to augment human intelligence and further enhance decision-making.

Airmen from the 36th Civil Engineer Squadron mix water and a low-strength concrete together in the area where simulated damage was created during an airfield damage repair training exercise on the Andersen Air Force Base, Guam, flightline Jan. 23, 2014. The 36th Civil Engineer Squadron Airmen were the first in the Air Force to receive training on a new airfield damage repair capability. (U.S. Air Force photo by Airman 1st Class Emily A. Bradley)

Focusing on base resilience and recovery, we must find innovative solutions to the challenges of supporting 21st century missions with a mixture of present-day construction and infrastructure that dates to the days of the Cold War and earlier. This requires an enterprise-wide culture fostering innovation and creativity in order to sustain aging systems, integrate state-of-the-art technologies, and identify ways to restore mission capability when systems are disrupted. Along those lines, AFCEC has been working diligently over the past few years to develop innovative ways to address airfield damage repair in the face of rapidly evolving threats, as we must always assess whether we have the tools and skills necessary to counter those threats, mitigate risk and assure mission success.

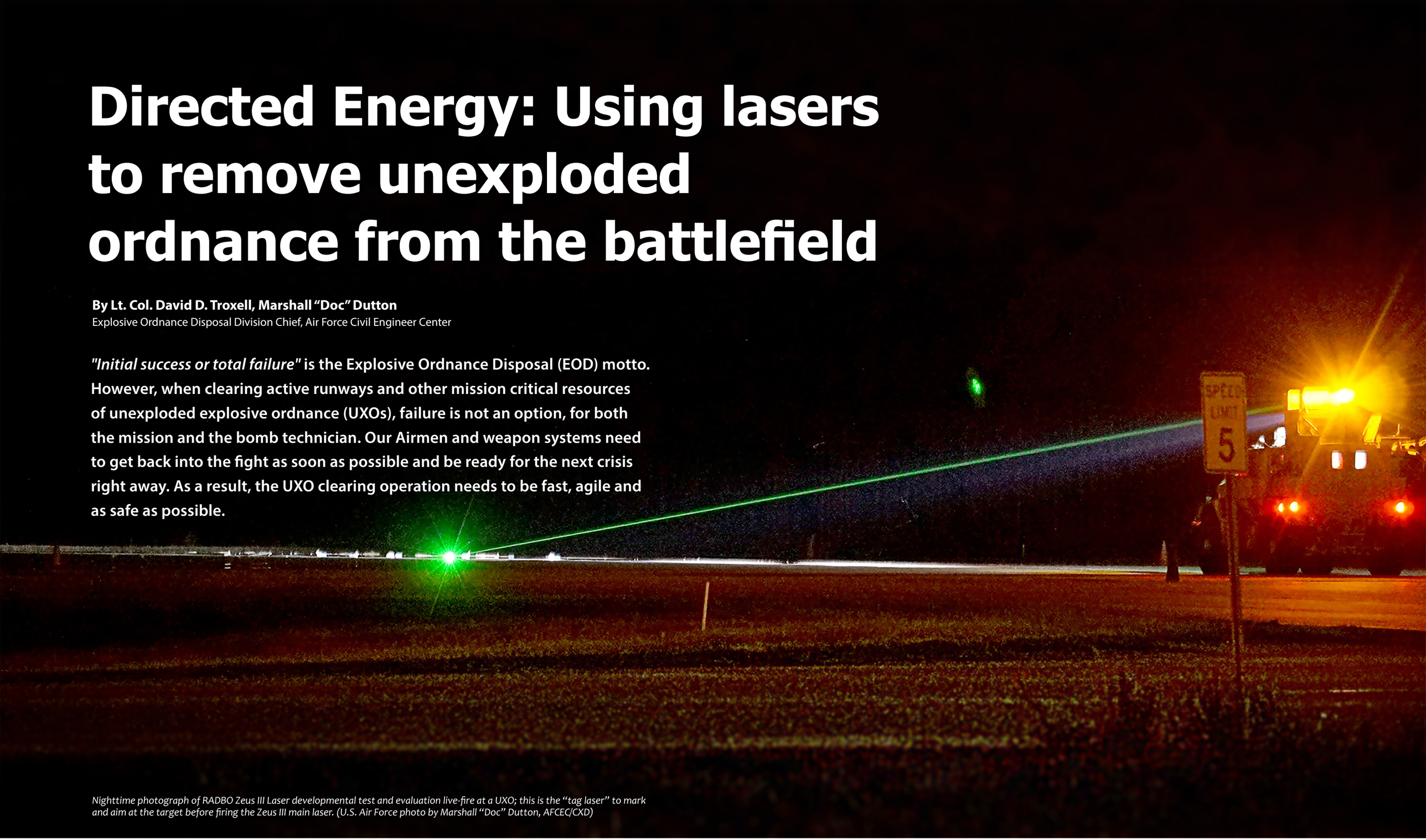
Our civil engineer enterprise governance remains hard at work, identifying the necessary tasks to achieve our stated objectives and meet our strategic end states. These tasks will operationalize the strategic guidance outlined in the Civil Engineer Annex and encourage innovative efforts of Airmen engineers across the globe.

Innovation lies at the heart of any effort to transform an enterprise as broad and diverse as Air Force civil engineering. Consequently, innovation underpins the Civil Engineer Annex to provide an overarching framework to influence how we invest our limited time, energy and resources. Yet, while the Civil Engineer Annex highlights where our enterprise is headed, its implementation and success depends on you. In order to excel in the most challenging environments imaginable, our civil engineer enterprise – and our Air Force – demands that you embrace the powerful sense of urgency required to fly, fight and win the nation's future wars through your new ideas and innovative spirit!

Directed Energy: Using lasers to remove unexploded ordnance from the battlefield

By Lt. Col. David D. Troxell, Marshall "Doc" Dutton
Explosive Ordnance Disposal Division Chief, Air Force Civil Engineer Center

"Initial success or total failure" **is the Explosive Ordnance Disposal (EOD) motto. However, when clearing active runways and other mission critical resources of unexploded explosive ordnance (UXOs), failure is not an option, for both the mission and the bomb technician. Our Airmen and weapon systems need to get back into the fight as soon as possible and be ready for the next crisis right away. As a result, the UXO clearing operation needs to be fast, agile and as safe as possible.**



Nighttime photograph of RADBO Zeus III Laser developmental test and evaluation live-fire at a UXO; this is the "tag laser" to mark and aim at the target before firing the Zeus III main laser. (U.S. Air Force photo by Marshall "Doc" Dutton, AFCEC/CXD)

So what do we do to eliminate UXOs and overcome a seemingly impossible standard? Build the Recovery of Airbase Denied by Ordnance (RADBO) Directed Energy (DE) platform, of course. Seemingly straight out of science fiction, the RADBO system is a tactical, vehicle-mounted laser for EOD operators to rapidly target and eliminate multiple UXOs at safe distances. Although it can be used as a standalone system at battlespace commanders' discretion and mission priorities, it will primarily be a mission-critical component and mainstay to Rapid Explosive Hazard Mitigation (REHM) operations for Air Force Civil Engineering's Rapid Airfield Damage Repair (RADR) program.

This idea is not new. As far back as May 1994, Gen. Merrill "Tony" McPeak signed the original Operational Requirement Document (ORD) while serving as the Air Force Chief of Staff. Unfortunately, the program was discontinued in 1997 due to military funding drawdowns following dissolution of the Warsaw Pact and posturing for what was dubbed the "Peace Dividend."[1] Additionally, the final product needed to be smaller for tactical viability, nowhere near what the laser systems of the past era with the same output and focal strength could provide, which exponentially increased costs. The program

ABOVE: *Photograph of the RADBO operator's view screen during a developmental test live-fire against a UXO.*

BELOW: *Profile photograph of RADBO Zeus III Laser System mounted to Mine-Resistant Ambush-Protected (MRAP) Cat I Cougar. (U.S. Air Force photos by Marshall "Doc" Dutton, AFCEC/CXD)*

did not stand a chance.

However, after the attack on the World Trade Center in 2001 and subsequent military campaigns in Afghanistan and Iraq, air operations increased in the Central Command (CENTCOM) theater. As this buildup progressed, so did the immediate corollary threat to our air forces from both of our adversaries' evolving military strategy strategies and increasingly complex technology to deny CENTCOM's almost perfectly uncontested ability to launch and recover

Stakeholders review final developmental testing for RADBO at Redstone Arsenal in Huntsville, Alabama. (U.S. Air Force photo by Marshall "Doc" Dutton, AFCEC/CXD)

aircraft. This threat significantly changed the air campaign strategy's post-attack recovery requirement to resume airfield operations from days to hours.

As a result, UXO mitigation and clearance needed to become faster with far less risk to EOD operators and equipment. With that, the requirement for increased standoff for blast and fragmentation protection became even more critical for continuous UXO operations. Every single inch, every barrier between EOD Airmen and an explosive device is a matter of life and death, or, in other words, a matter of initial success or total failure of the entire mission.

Since the DE idea was only shelved and not forgotten during the years between, in 2012 the Air Force Central Command (AFCENT) Civil Engineer submitted an Urgent Operation Need Statement (UONS) to then Lt. Gen. David L. Goldfein, AFCENT Commander under Air Combat Command (ACC), for the RADBO DE system through a rapid acquisition program. Upon approval, the UONS was assigned to the Air Force Life Cycle Management Center (AFLCMC) at Robbins Air Force Base, Georgia, as an integration of the 3-kilowatt Zeus III laser to the Mine-Resistant Ambush-Protected (MRAP) Category I Cougar. As a result of the program and technology complexity, meeting the rapid development period deadlines of 180 days was problematic, so the ACC Requirements Oversight Council directed its re-designation as a modification to the existing MRAP weapon system. Thus began the current full-fledged acquisition as a Program of Record.

The Milestone C production decision for the RADBO DE Zeus III laser was made May 29, 2018 as a result of cooperation between AFLCMC Support Equipment and Vehicles (WNZ) office and the Air Force Civil Engineer Center at Tyndall AFB, Florida, as the program's current sponsor under the Air Force EOD Modernization Program. Both organizations are also partnered with the Prototype Integration Facility (PIF) and the Redstone Arsenal Test Center, both in Huntsville, Alabama. In addition, EOD operators from across the Air Force provided input throughout developmental testing to ensure end-user functionality is matched to mission demands.

Upon fielding, now that the airbase recovery strategy has grown from AFCENT to a global requirement, RADBO DE's Zeus III laser will be able to mitigate and clear UXOs from safe standoff distances using a 3-kilowatt fiber optic laser system[2] thanks to the diligence, grit and determination of field-level EOD operator input and support, engineering and scientific technology development, and outstanding program management by the Prototype Integration Facility (PIF) and AFLCMC/WNZ. To the Air Force's credit, seizing the opportunity for innovation and advances in technology since its inception, RADBO will also be the first ground-based laser weapon system in the Department of Defense inventory.

About the authors: Lt. Col. David D. Troxell is the Explosive Ordnance Disposal (EOD) division chief assigned to the Air Force Civil Engineer Center (AFCEC) at Tyndall AFB, Florida. Marshall "Doc" Dutton is the Air Force EOD Modernization Program manager within the AFCEC EOD Division.

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1 Newsweek Staff, "The Peace Dividend," Newsweek, July 01, 2010, accessed April 26, 2018, http://www.newsweek.com/peace-dividend-169570.
2 "AF EOD Laser System Enters Testing," U.S. Air Force Civil Engineer Center, March 17, 2015, accessed April 26, 2018, http://www.afcec.af.mil/News/Article-Display/Article/871503/af-eod-laser-system-enters-testing/.

Transforming learning with virtual reality

By Timothy Fuller, Capt. Paul Weskalnies, Rick Kappel, Cheryl Silcox
Department of Engineering Applications, AFIT/CEC

"The OASIS has replaced brick-and-mortar locations…" – Ernest Cline, Ready Player One

At The Civil Engineer School (TCES), instructors are elevating the learning experience by using immersive virtual environments to allow students to experience real-world working environments. One of the limitations of the traditional brick-and-mortar classroom has been that students could not directly associate what they learned with what they would later experience in the field. Virtual experiences not only increase student engagement, they also increase retention of the content they are learning.

TCES first became involved in the use of virtual worlds in 2017 through the application SketchUp, 3-dimensional (3D) modeling software used to create an interactive mechanical room model allowing students to virtually inspect various system components and identify system faults. SketchUp provided an environment in which instructors could modify system variables, and thus create realistic operational scenarios in which students could identify flaws and deficiencies in the systems. SketchUp models allowed instructors to demonstrate how personal interpretation of 2-dimensional drawings can result in multiple 3D configurations. While SketchUp provided a working mechanical room model, it lacked the realism of an authentic mechanical room.

Rick Kappel, an instructor at The Civil Engineer School, walks students through an immersive, virtual tour of the Wright Patterson Air Force Base Recycling Center as part of the WENV 160 Qualified Recycling Program course. (Courtesy photo)

At the end of 2017, TCES purchased a high-quality 3D camera that makes it possible for instructors to capture any environmental space and create realistic, interactive, 3D-immersive, virtual environments. Once the space has been captured, descriptive tags, web links, pictures and videos can be added. Multiple mechanical rooms at AFIT have been transformed into 3D virtual environments for use in lessons, taking the education of Air Force engineers to a whole new level.

The first implementation of this technology was in WENG 560 Fundamentals of HVAC Design and Analysis, a fully online course. In this course, instructors created a scavenger hunt in a virtual mechanical room asking students to identify components and point out exchangers incorrectly installed. The final project in the course expanded on this exercise by linking two mechanical rooms with the building roof and asking students to draw a piping diagram for the building's hydronic system, including cooling towers, chillers and air handling units. By using the virtual mechanical room in this exercise, the instructors know when to answer questions as the students refer a consistent environment. This allowed them to more effectively evaluate students' progress toward meeting their learning objectives.

Since the initial implementation, the environmental management department has captured two environments for use in multiple courses. The first of these sites takes students on a tour of the Wright Patterson Air Force Base (WPAFB) Recycling Center. In this virtual environment, students are able to investigate processing equipment like bailers, shrink wrappers and shredders, see the facility layout and processing procedures, visit web links to sites where they can learn about oil regulations, price values for bailed commodities and safety equipment, and view various videos on solid waste topics. Another site allows students to investigate a well-constructed and organized installation level hazardous waste storage site. The application of immersive, virtual, CE-centric environments for education and training purposes is limitless. As the Air Force Institute of Technology prepares to celebrate 100 years of education in 2019, TCES leads the way in delivering vital, relevant and connected education to Airmen civil engineers.

About the Authors: Timothy Fuller is the director of the Department of Engineering Applications at TCES and the school lead for academic technology. Capt. Paul Weskalnies (mechanical engineer) and Rick Kappel (environmental management) are instructors at TCES. Cheryl Silcox, is a contract designer supporting TCES.

Air Force seeks innovative approach to procuring and managing installation energy

By Shawn Bennett
Energy-as-a-Service Lead, Office of the Deputy Assistant Secretary of the Air Force for Environment, Safety and Infrastructure

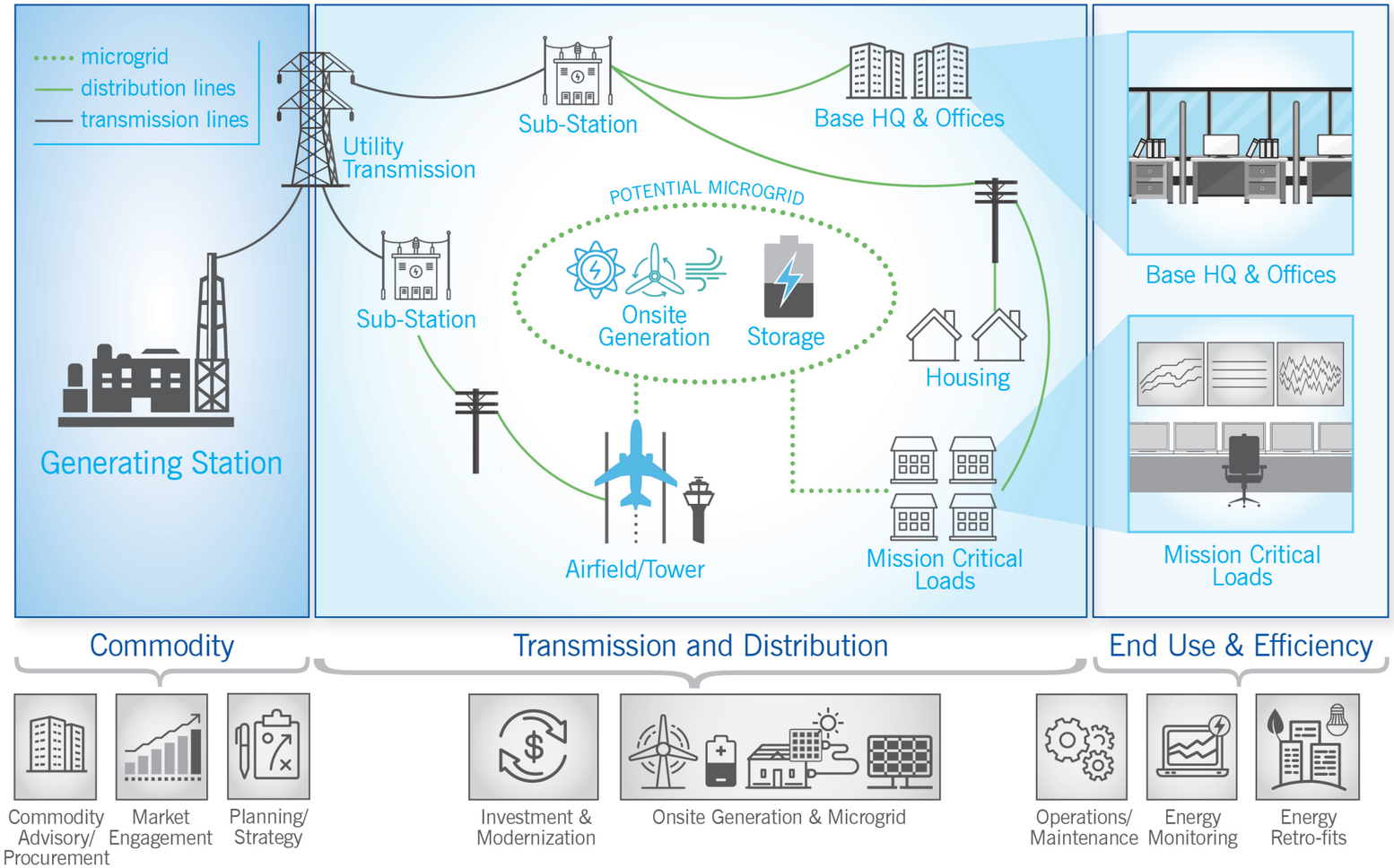
The Air Force depends on reliable, high-quality power to execute its mission and run the day-to-day operations of installations. As the Department of Defense seeks to increase resilience and strengthen its energy security posture, the Air Force is leading the way to pilot an innovative business model referred to as Energy-as-a-Service (EaaS) that aims to address the DoD's ambitious energy assurance goals.

Conceptually, EaaS approaches the task of powering Air Force installations and securing critical missions in a comprehensive manner that provides a full-service energy capability. Just like a taxi or ride-sharing service does not require individuals to actively manage the car's upkeep to receive a ride from point A to point B, EaaS would similarly allow the installation to focus on the outcomes energy provides: enabling Air Force missions.

This shift in focus, from buying the commodity to buying the capability, represents a change in the Air Force energy business-as-usual approach. Under the current Air Force energy landscape, energy needs are met by various entities with disjointed acquisition vehicles and differing priorities. EaaS is intended to be a streamlined acquisition and management process that, under one contract, aligns the incentives to more effectively and efficiently meet electricity-based mission requirements at Air Force installations. This means viewing installation energy through the entire supply chain from commodity purchase to on-base generation and distribution to final consumption within the individual facilities.

To do this, two pilot installations were identified to demonstrate EaaS at Altus Air Force Base, Oklahoma, and Hanscom AFB, Massachusetts. A Request for Information (RFI) was published in July 2017 to acquire industry input and to further engage with stakeholders, including industry and the Air Force chain of command from installations to headquarters, to build the best possible framework for EaaS. Through effective communication and coordination, the Air Force can leverage the money, manpower and expertise from industry to meet mission needs. Throughout this EaaS concept development process, Ohio State University peaked Air Force interest, as they were awarded a similar contract in April 2017 for what it's calling Comprehensive Energy Management. The project entails a 50-year lease of the university's energy assets, with a goal of incentivizing sustainable, high-quality and efficient operations. It is exciting to be at the forefront of new ideas and innovation in the energy space, but it also helps to have a few partners along the way to share ideas and lessons learned.

With the overall picture of what EaaS will look like for the Air Force, the current focus is on developing a procurement pathway that fosters a flexible, long-term relationship between the installation and EaaS provider where the provider's expertise and financial resources can be maximized to tackle the challenge of energy resilience. This may involve an iterative development process that allows innovative opportunities to be leveraged in changing energy, threat and fiscal environments. Going forward, the EaaS team will continue to work closely with a wide range of stakeholders and subject matter experts to determine the most effective options for procurement and develop draft requirements for both pilot projects.



(U.S. Air Force graphic)

The Energy-as-a-Service Request for Information is available on the Federal Business Opportunities (FBO) website at https://www.fbo.gov/spg/DLA/J3/DESC/SP0600-17-0424/listing.html. Those interested in the Air Force EaaS pilot program are encouraged to monitor the link and watch for further updates.

Integrated Base Defense ... *CE Style*

By Chief Master Sgt. Jeremiah F. Grisham, Master Sgt. Brandon Pfannenstiel, Maj. Adam Burwinkle
Explosive Ordnance Disposal, AFIMSC/Detachment 8

The Air Force, like any large organization, has its buzzwords, jargon and bumper stickers, some more fixed than others, and some harbingers of true change to our Service. Today, leaders are focusing on combat support integration, and regardless of whether it is mentioned in the context of integrated base defense, adaptive basing or dispersed basing, the integration of combat support into operational and tactical planning is crucial as the Air Force prepares to project airpower in near-peer or peer environments. One organization that has been providing agile combat support to airpower since 1997, with roots going back into the 1960s, is the 820th Base Defense Group (BDG). The 820th BDG has been securing airfields in contested environments for over 20 years with the help of civil engineers. Most recently, they have added CE Airmen of a new and different variety: Explosive Ordnance Disposal. With this addition, the 820th greatly improved how it enables airpower.

The 820th's mission is simply: "The Base Defense Group protects, defends and fights to enable Air Force, Joint and Coalition missions." They are the team you call after you have just seized an airfield and you want to pivot to airbase opening now. They can be on the ground providing integrated base defense in 96 hours, allowing Air Component Commanders to bring in follow-on forces. The BDG gets to the fight so fast by maintaining airborne qualifications. The 820th is capable of operating in permissive, semi-permissive, uncertain or hostile environments, and they conduct missions inside or outside the wire with the agility needed to support combat operations. Additionally, the Group is trained and equipped to insert with Army Airborne Divisions, seamlessly conducting joint operations and allowing Army ground maneuver forces to push out from and establish a Base Secure Zone.

In order to provide these capabilities, the 820th BDG leverages organic, cross-functional expertise. EOD Airmen are the most recent additions of the BDG Tree's CE branch, which currently integrates 13 combat support Air Force specialty codes, each organized in teams best suited to effectively support the BDG with their specific skill sets. The highly trained EOD operators are organized in two-person teams, each with the capability to defeat improvised explosive devices and conduct render-safe procedures on unexploded ordnance, all while adhering to the BDG byline: every Airman a trained rifleman.

In the joint environment, EOD Airmen ensure freedom of movement throughout the operational environment as their core mission of EOD. To get the job done, each team is prepared to jump into the fight with all of the necessary tools, explosives and personal protective gear needed to operate for up to five days. Recognizing this as an opportunity to leverage lessons learned from previous combat experiences, AF EOD leadership has established the lightest and leanest mobility equipment cell available, "the JB," which is designed specifically to support Special Operations Forces. The equipment cell has been further tailored to provide support to the BDG's unique mission requirements and maximize EOD's contribution to the integrated defense team. Likewise, the Airmen have drawn heavily on lessons learned from Operation Iraqi Freedom and Operation Enduring Freedom in order to develop a training cycle that is heavily slanted toward ground combat operations. While the work AF EOD performed throughout those operations was primarily to support Army ground forces, this mission in the BDG is all about Airmen supporting Airmen and their combined combat support serving as the bedrock upon which airpower is projected. The EOD inclusion in the 820th BDG provides another opportunity to the larger EOD community as a whole: the ability to continue to train and practice those skills gained from hard experiences in Operation Iraqi Freedom and Operation Enduring Freedom so that our service continues to retain them.

ABOVE: *Tech. Sgt. Alan Garrison performs a remote pull.*

PREVIOUS PAGE: *820th Base Defense Group Airborne. (U.S. Air Force photos)*

The three 202-member Base Defense Squadrons, which comprise the 820th BDG, have a rigorous and demanding operational tempo: six months dedicated to Global Response Force Operations; followed by a six-month Air Expeditionary Force (AEF) rotation; followed by a six-month training and refit cycle. There is no "off-cycle" and specialists like EOD, emergency management and communications must maintain their core skillsets while training and integrating into the main Security Forces body. To combat burnout and skill deterioration, civil engineers assigned to the BDG are on three-year controlled tours. This rotation ensures the Commander of Air Force Forces always has a battle-ready, sharp and skilled force at their disposal, while balancing the personal needs and development of individual Airmen.

Combat Support Wing, Integrated Base Defense, Adaptive Basing and Dispersed Basing are all initiatives that are part of the current effort to adapt how the Air Force executes its mission to fly, fight and win in contested environments.

CEs in the 820th BDG are on the forefront of that effort, providing combatant commanders with flexible, scalable, air insertable and airborne combat support options ready to meet the need of Air Force, joint and coalition combat forces.

366th Training Squadron explosive ordnance disposal preliminary course students perform team sit-ups in between ruck marches April 26, 2018. The 26-day course located at Sheppard Air Force Base, Texas, has suffered high attrition rates in the past, but through collaboration with Midwestern State University in Wichita Falls, Texas, they have been able to cut down injuries along with attrition rates. (U.S. Air Force photo by Senior Airman Robert L. McIlrath)

EOD revamps physical training regimen

By Senior Airman Robert L. McIlrath
Photojournalist, 82nd Training Wing Public Affairs

"PT for them was getting 'smoked every day,'" said Staff Sgt. Shawn Briggs, 366th Training Squadron explosive ordnance disposal preliminary course instructor.

The term "getting smoked" refers to exercising in a continuous manner to the point of physical exhaustion.

For the Airmen attending the 26-day explosive ordnance disposal (EOD) preliminary school at Sheppard Air Force Base, Texas, before January 2018, getting smoked was their daily morning routine.

The EOD preliminary school was designed to filter out the best candidates to go on to the Navy School Explosive Ordnance Disposal at Eglin AFB, Florida, and weed out those who did not meet standards.

"Being here and passing shows that you deserve to be an EOD candidate," said Airman 1st Class Margaret Sowell, EOD preliminary course student. "It shows you have what it takes."

Senior Airman Michael McKnight, a 366th Training Squadron explosive ordnance disposal preliminary course student, crawls through the sand pit at Sheppard Air Force Base, Texas, April 26, 2018. The students completed a three-mile ruck march before crawling the length of the sand pit. (U.S. Air Force photo by Airman Madeleine Remillard)

For the students, the daily rigors of intense physical training started to take its toll and more candidates were dropping from the program or getting injured.

"Injuries were costing the Air Force a lot of money and most of the attrition was coming from injuries and self-eliminations," said Master Sgt. Joshua Crowley, 366th TRS EOD preliminary course superintendent. "We had 100 to 150 students that were on injury profiles at any given time here."

Injury profiles prevented students from participating in physical training, which, in turn, prevented them from attending class.

"It's about $215 a day to house and feed each student," Crowley said. "When they are stuck here for close to half a year, it adds up."

With profiles lasting on average from 90 to 100 days and the high demand from the Air Force for EOD technicians, something had to change.

Crowley said they met with 82nd Training Wing commander Brig. Gen Ronald Jolly Sr. and were asked by the senior leader what they needed to turn the tide.

That's when Jolly mentioned P4 initiatives, programs that can be Public-Public or Public-Private ventures. In this case, it was the Air Force and civilian organizations collaborating to get something accomplished without spending a bunch of money.

"We had exercise physiologists from Midwestern State University in Wichita Falls, Texas, observe our PT program and make suggestions on how we can prevent injuries," Crowley said. "Just that would have cost us about $750,000 to $800,000 but we get it for free."

After observing their PT sessions for a few months, they developed a new PT program to reduce injury and enhance performance.

"They sent their graduate students here from MSU," Briggs said. "They were able to say, 'Hey, the order that you're doing these things is causing the injuries.'"

Along with developing a new PT program, the graduate students also trained instructors on physical education.

Airman Kyle Cota, a 366th Training Squadron explosive ordnance disposal preliminary course student, sketches the explosive device discovered during a reconnaissance exercise at Sheppard Air Force Base, Texas, April 26, 2018. Before beginning the exercise, the student had a fixed amount of time to ask questions about the location and appearance of the explosive device as well as decide what equipment would be needed to accomplish the mission. (U.S. Air Force photo by Airman Madeleine Remillard)

Before instructors are allowed to teach a class, they have to complete and pass a basic instructor course.

"Most of the instructors don't have formal training in physical fitness outside of what they've done in their Air Force career," Briggs said. "The whole purpose behind the P4 initiative was to make PT make more sense."

Most injuries were the result of the ruck march portion of PT. The students would carry a weighted pack on their back and march several miles without stopping.

"They start out with about 35 pounds with a 15-pound vest and then move to 45 pounds of weight in their ruck," Briggs said. "Rucking was causing about three to four injuries a week."

Briggs mentioned that they still put the same stress on them, but they allow more recovery time and focus on different parts of the body for their workouts.

"We ruck once or twice a week now and give them more time to recover," Briggs said. "It's nearly eliminated the injuries. We've only had one or two this year."

Along with creating a new PT program, a new physical test called the Physical Abilities Identifier (PAI) was implemented on the very first day of class to better gauge where the students were physically.

"If you don't pass the PAI, then you don't get to start class," Briggs said. "The Candidate Development and Support Service is here with the sole purpose of training them physically if they fail the PAI."

The CDSS builds candidates up physically to better prepare them for the rigors of the training ahead.

"It's still a physically demanding career field, that hasn't changed. But we turned it more into a progression thing now," Briggs said. "If you're not a PT stud when you get here, that's ok. As long as you're willing to push yourself and put in the work, you have time for improvement."

Airman Kyle Cota, 366th Training Squadron explosive ordnance disposal preliminary course student, glances through a pair of binoculars at Sheppard Air Force Base, Texas, April 26, 2018. Each student had the chance to exhibit the knowledge they gained throughout the course by leading a reconnaissance exercise. (U.S. Air Force photo by Airman Madeleine Remillard)

Along with an improved PT regimen and civilian PT trainers, the preliminary course has also added a clinic to the EOD compound.

"We have mental health come out here to help with our self-eliminations, medics are out here during PT and physical therapy to help students when they start to feel injured," Crowley said. "Basically, everything you could get at the medical group besides labs and an x-ray, you can get out here."

A medical residency program at Eglin AFB, Florida, is tracking the program with plans of implementing it at Navy School Explosive Ordnance Disposal (NAVSCOLEOD).

"Prior to us starting this new program, we had people all over us wondering why we keep breaking students and our attrition rate kept spiraling out of control," Crowley said. "Now we have a graduation record and the school is running perfectly."

In total, the changes made to the course have saved the Air Force $2.6 million and have resulted in a 35-percent decrease in medical holds, 42-percent drop in self-eliminations, 900-percent increase in support with no cost to the Air Force and a 50-percent decrease in medical and discipline eliminations.

A mock-up of the middle tetrahedron joint area of design of the U.S. Air Force Academy Cadet Chapel in Colorado Springs, Colorado. (U.S. Air Force photo by Megan P. Robare)

Chapel renovation tests ensure design excellence

By Megan Robare
Design Project Manager/Acquisition Technical Team Lead, Facility Engineering Directorate, Air Force Civil Engineer Center

The U.S. Air Force Academy (USAFA) Cadet Chapel in Colorado Springs, Colorado, is culturally and historically significant to the Air Force, the USAFA and our nation. The highly celebrated example of post-modernist architecture opened in 1962 and hosts between 500,000 and one million visitors annually.

After more than 55 years of use and adverse weather, the Air Force recognized the need for a complete facility renovation to the historic facility. The design and construction strategy addressed damaging, weather-related water intrusion into the structure. The Air Force Civil Engineer Center (AFCEC), the execution agent for the unique exterior renovations, acquired a designer to create an innovative, comprehensive repair solution for preventing water intrusion.

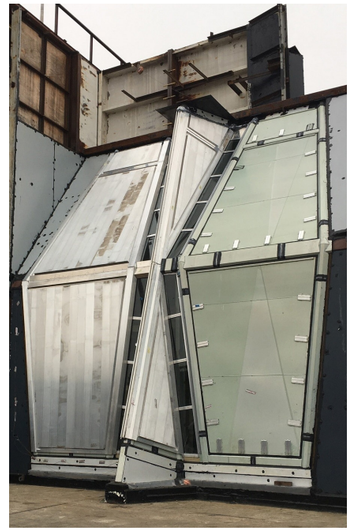
Key project requirements are to preserve the landmark's aesthetic properties, construct a design that withstands environmental conditions, include restorations of exterior deterioration, repair organ and pews, provide antiterrorism protection upgrades and modernize fire protection systems. AFCEC applied a cost-effective strategy for the Chapel's renovation. This was accomplished by testing the design prototype and then constructing it to perform as intended prior to finalization.

The Architectural-Engineering design team, including AECOM, Hartman-Cox Architects and Wiss, Janney, Elstner Assoc. Inc. (WJE), instrumented and tested the Cadet Chapel to investigate the current structural performance and isolate causes of water intrusion. Based on the findings, the design team concluded that a permanent solution necessitated full replacement of the weatherproofing elements of the Chapel exterior.

The 150-foot, aluminum, glass and steel structure features 17 spires composed of 100 tetrahedrons covering the upper level. Continuous panels of brilliant stained glass enclose the tubular tetrahedrons, enabling diffused light to enter the building. The design team understood the new exterior spires had to:

- Replicate the appearance of existing exterior, to meet USAFA and Colorado State Historic Preservation Office (SHPO) Standards
- Arrest water intrusion
- Improve thermal performance and reduce the building's energy consumption
- Repair damaged stained-glass block

After completing the replacement design for repairs, the Air Force embarked on constructing a mock-up section to test the design solution under a variety of circumstances. Two



The upper tetrahedron mock-up of joint area of design that will sit atop the U.S. Air Force Academy Cadet Chapel in Colorado Springs, Colorado. (U.S. Air Force photo by Megan P. Robare)

full-scale panel mock-up replicas of the design were constructed to confirm that the renovated building would not sustain damage from weather-related events or other factors (differential movement of the structure was considered). These tests were conducted under various conditions:

- Dynamic water testing, with simultaneous application of pressurized water having a wind-speed equivalent to 63 mph
- A range of thermal loads; as cold as 0°F and as hot as 100°F
- Induced movement of the structural frame support at deflections derived from the structural analysis model under design structural loads

After testing, results from the mockup concluded the proposed replacement design fully met all performance criteria in these scenarios. Also, while constructing the mock-up, designers identified potential challenges that could occur during panel assembly. Although the mock-ups fully simulated the proposed design's technical performance, the tests did not include the construction of final aesthetic features and materials that would replicate the building's properties.

With this information, the team took the opportunity to fabricate and test further innovations in the design details and find requirements to achieve the same performance. Reducing time and cost to construct included:

- A modified pipe clamp design that significantly simplifies installation
  - Previous custom pipe clamp anchors that were attached to the exterior panels of the structural steel were ultimately too labor-intensive to install. The time period to install one clamp was reduced from over 60 minutes to under 15, resulting in significant time and cost savings for the installation of the required 1,000 clamps.
- Modified welding procedures for metal panels containing the building insulation
  - Regarding the inboard of the visible exterior aluminum panels, metal panels provide weather resistance for both water intrusion and heat. Mockup fabrication identified that precise machine welding was necessary to prevent warping and pitting which would diminish panel performance.

AFCEC's initiative for testing the chapel prototype validated the renovation's design could resist negative impacts from weather events. Further, the Air Force resource investment during the design phase potentially reduced construction expenditures and the risk for future costly-renovations and/or repairs. This investment will also ensure the restoration and preservation of the Cadet Chapel will allow all future cadets a place for all religions to worship and gather together.

Empowering the Force Posture Agreement

By Kelly Livingston
Bed-down Program Manager, Air Force Installation and Mission Support Center, Detachment 2

With the announcement of the "Pivot to the Pacific" by then President Barack Obama, Pacific Command (PACOM) and its service components reached out to multiple Asian Pacific countries with an eye on joint cooperation, exercises and operations. For Australia, this outreach cumulated in the signing of the U.S. – Australia Force Posture Agreement (FPA) on August 12, 2014. For the Air Force, the FPA targeted flying operations out of Royal Australian Air Force (RAAF) Darwin and RAAF Tindal; located in the Northern Territory of Australia. After nearly 20 months of planning and design, one of the two "Pathfinder" projects, a 38,000-square-meter aircraft parking ramp for RAAF Darwin, is ready to award with construction scheduled to begin in July 2018. Innovative planning and flexible processes were required to get the project to execution. These same processes will continue to evolve as the Air Force works to ensure the next nine military construction (MILCON) projects for RAAF Darwin and Tindal, programmed for FY18-FY23, are planned, designed and eventually awarded for construction.

To ensure success with such a unique effort, the Joint Facilities Working Group (JFWG), which serves as the Command and Control (C2) function for FPA infrastructure requirements, was created. The JFWG is chaired by two joint force organizations, U.S. Pacific Command Engineering Division (PACOM/J44) for the Americans and the U.S. Force Posture Initiatives Office (USFPIO) for the Australians. The JFWG has ensured the various organizations executing multiple facets of the FPA -- Pacific Air Forces (PACAF), Marine Corps Forces Pacific (MARFORPAC) and Naval Facilities Command Pacific (NAVFACPAC) — fully coordinate actions and leverage each other's experiences and capabilities. The JFWG provides a pathway to quickly cut across the stovepipes existing within each country's service and functional commands to resolve issues. The JFWG meets face-to-face twice a year and holds a monthly video teleconference, but, more importantly, it has empowered the lower-level working relationships to support the daily phone calls and emails necessary to keep projects on schedule. While similar bilateral and joint organizations provide support throughout the military, the Australia – U.S. JFWG is unique in its focus on infrastructure planning and construction.

While the first two projects at RAAF Darwin laid the groundwork for coordination and management processes, these two projects were selected for their relative simplicity. The next two projects have complicated designs and construction challenges forcing innovative thinking and proactive project management. The first project is the construction of a bulk fuel storage farm at RAAF Darwin. The fuel tank design will follow the PACAF standard "cut-and-cover" style tanks due to restrictive environmental restoration sites and overlapping explosive safety standoff requirements. While these cut and cover tanks are a PACAF standard, the Australians do not have any experience with this fuel storage method. Instead, the standard Australian fuel tank is above ground, made from stainless steel and very expensive to construct.

To gain the RAAF support, the cut-and-cover standard designs were reviewed in detail over the course of several joint planning workshops. These workshops culminated in a tour of existing cut and cover tanks and a Type IV Fuel Hydrant System at Misawa Air Base, Japan, with RAFF fuel operators and engineers. The RAAF accepted the cut-and-cover style tanks as their new standard. However, the standard designs still had to incorporate Australian building codes and fuel operations requirements. The U.S. Army Corps of Engineers (USACE), who maintain the standard cut-and-cover tank designs, were added to the Air Force project team to explain the basis of design decisions to Australian engineers and ensure any modifications driven by Australian requirements do not negatively impact the fuel system's functionality. While an Air Force-funded MILCON project in Australia, executed by NAVFACPAC, with technical support from the USACE , may seem like an organizational challenge, the project's design successfully launched in February 2018 and is currently on schedule.

The second hurdle for the JWFG to overcome resides at RAAF Tindal, located in the Australian Outback, close to the city of Catherine approximately 206 miles south of RAAF Darwin. RAAF Tindal is undergoing a tremendous makeover as the RAAF transitions from F-18 to F-35 fighters and adds RAAF KC-30 tankers (similar to the Air Force's KC-46 tankers) as permanently assigned aircraft. For RAAF Tindal, four cut-and-cover fuel tanks are planned for construction — two RAAF tanks to support the RAAF's mission and two tanks to support Air Force mission requirements. At first glance, these projects seem easy, as the design of RAAF Darwin's fuel system should eliminate the technical hurdles of adopting a U.S. standard design to Australian building codes. However, the challenges at RAAF Tindal are driven by two governments' approval processes and the limited construction worker capacity in the Outback. For instance, construction will be executed by a fly-in/fly-out workforce living in temporary worker camps since the population of Catherine is approximately 10,000 with only three operating hotels.

Mobilization of heavy-duty earthmoving and concrete paving equipment will drive lengthy lead times and costs as the RAAF extends and widens its current runway and taxiways to support the KC-30 flying mission. Timely and cost-effective construction for the Air Force fuel tank project will require RAFF and Air Force fuel tank construction schedules overlap just enough to maximize the availability of labor and equipment, while preventing demobilization from the area. PACAF and the Air Force Installation and Mission Support Center (AFIMSC) Detachment 2 received approval from Headquarters AFIMSC and the Air Force Civil Engineer Center (AFCEC) to design the two projects' fuel systems concurrently to ensure the systems are interoperable and all supporting utilities are correctly sized to support all four tanks, off-load stations and hydrant fuel pumps. To manage such a huge program, the JFWG directed the use of a project manager's favorite tool, the Gant chart. In fact, it is a very complex and comprehensive Gant chart that is paying back every day as designs continue.

The appropriate times for project design and execution were identified by overlaying Australian Parliament's and the U.S. Congress' project approval and authorization processes with anticipated project schedules. The Gant chart predicted the correct path, as the Australian program recently awarded their managing contracts for the RAAF Tindal projects and NAVFACPAC received 100 percent design authority, all within a two-week timeframe.

The innovative processes used to support the FPA projects in Australia have enabled a small team of planners and engineers to rapidly move a program more than $500 million forward. Applying joint C2 processes to infrastructure planning and construction through the JFWG construct addressed the need to quickly coordinate information, resolve issues and collaborate on solutions across bilateral and joint force organizations. The end state is to ensure the PACOM warfighters have the right locations to fly, fight and win should the need arise in the future. As the Asia Pacific Stability Initiative continues to evolve, the lessons learned in Australia will be applied to infrastructure development and construction at "places without bases" throughout the PACOM area of responsibility.

Taking elevator technology to the next level

By James "JT" Trantham
Contracting Officer Representative for Elevators, 10th Civil Engineer Squadron, U.S. Air Force Academy, Colorado

The U.S. Air Force Academy (USAFA) is a combination of military installation and college campus, a challenging assignment for any civil engineer. One of the unique facets associated with being there is the number of elevators we maintain. USAFA has over 86 types of vertical transport equipment (VTE), to include passenger and freight elevators, handicap lifts, dumbwaiters and dock levelers. The demand for the VTEs to be operational is critical to support the Academy mission with over 4,000 cadets plus support staff. The majority of the VTEs are over 30 years old, and even though the motors are still going strong, the control systems need to be upgraded to better serve our customers. The new technology for the controls will significantly reduce elevator callouts and downtime, and the nonproprietary control panel system comes with multiple applications and efficiencies.

After installing a few of the nonproprietary control systems, our trouble calls went from 10 per month on a single VTE to five calls per year. The positive response from our customers and the critical need to replace over 30 VTEs drove our initiative to develop and execute a plan for a major VTE re-modification project. We were successful in capturing $4 million to proceed with design and phase one this fiscal year. It was very exciting when we were told by the elevator consulting firm hired to help with the process of the VTE re-modification contract, that it would be the second largest elevator contract in Colorado history.

Once the VTE upgrades are complete, the improvement in capabilities and controls of the VTEs is easy to see. The present VTE control systems have multiple circuit boards and relays. Due to the age of equipment, if one board goes down, the elevator could be out of service for weeks due to trying to locate outdated circuit boards. The new control panel operates on a single common circuit board and, with a simple reprogramming, control panel circuit boards are interchangeable between any of the upgraded VTEs in as little as one day. With the new control panels, the VTEs can also be programmed to run periodically at night and do function checks to keep the hydraulic fluid and mechanisms warm so the VTE is ready for use first thing in the morning. This is important to us at USAFA, where extreme changes in temperature lead to reliability issues with our elevators. One example is our cadet dining facility, Mitchell Hall, where 12,000 meals are served to the cadets every day. These hydraulic VTEs are located in dock areas open to the elements and have daily issues with the doors operating properly when temperatures are below freezing. Once the hydraulic fluid and doors are moving, they operate fine. It is vital for us to keep the VTEs at Mitchell Hall operating at peak efficiency when dealing with food delivery and service.

James "JT" Trantham, contracting officer representative, center, explaining to stakeholders the functionality of the new control system with the help of the onsite elevator contractors Robert Hanson, left, and Kyle Munson. (U.S. Air Force photo by Master Sgt. Jasmine Reif)

There are some additional operational benefits with the new control system to streamline future service and maintenance. Engineer technicians can operate and communicate with the new VTE control system with an internet connection and are able to pull a report from their desk, which may prevent trouble calls and significantly reduce downtime. The report will also give technicians error codes, warning them of possible operational issues, and can be used to ensure the contractor is completing preventive maintenance in a timely manner. To control access in the buildings and provide added security measures throughout the Cadet campus, the new control system can also be programmed to shut down at the request of the customer.

With the VTE control systems USAFA currently has in place, we are very limited on what we can do to prevent downtime and keep our focus on the mission of "graduating leaders of character." Looking ahead, through innovation and technology, the control panel upgrades will provide the 10th Civil Engineer Squadron (CES) and our customers with a wide range of capabilities to meet our core mission here at USAFA. The engineers of the 10th CES are paving the way for the Air Force's "leaders of tomorrow."

The author would like to acknowledge Lt. Col. Eric E. Rollman, Keith Butala, Fred Williams, Lorenzo Luechtefeld, Ashley Edwards, David Vandale and Gifford Vanalstyne for providing feedback and comments.

CE DASH
A Year in Review

By Col. Timothy Dodge
Deputy Director, Air Force Civil Engineer Center

Things can dramatically change in one year. Powerhouse teams of Air Force engineers who demonstrate their commitment to the enterprise are virtually unstoppable — whether in the spotlight or behind the scenes. You are the secret to our CE DASH success.

CE DASH, our civil engineering SharePoint site "dashboard," launched in May 2017 with the primary intent to quickly provide technical support designed with the field in mind. I am amazed at the outstanding enterprise support for our site. We are averaging about 35,000 page views each month.

CE DASH is a one-stop-source for our subject matter experts and CE DASH content managers to share the latest information with the field. It is equally valuable for the field to know where they can find official information and keep up-to-date on what's hot.

Content is organized in a simple-to-navigate style. We now have 73 services and 259 topics, from airfield lighting to pesticides, each with resources, frequently asked questions and announcements advertising upcoming trainings and events.

CE DASH also has 20 workspaces for internal team collaboration.

By the end of fiscal 2018, we will have over 15 tools, data calls and dashboards available. If you were not aware, many of you leveraged the new CE DASH Integrated Priority List (IPL) Validation Tool to help build the fiscal 2019-2021 project list. You uploaded 13,000 documents to help validate over 2,500 projects.

In June 2018, the AFCEC Pavement Evaluation (APE) Team Report Tool became the latest addition to the growing suite of tools launched on CE DASH. The APE Tool is the first on CE DASH to leverage Google Maps to provide users with a location-based repository of airfield pavement reports.

This year, we've also automated a handful of data calls, including the Utility System Outage Report (USORT) which launched in May 2018. USORT is currently set up for installation electrical outage reporting, and we anticipate adding modules to track other outages such as natural gas and water in 2019. We will use this data to inform and automate our end of the fiscal 2018 Department of Defense data call and annual energy report to Congress, minimizing additional requests for data from the installations.

Since CE DASH launched, the Reachback Center (RBC) and our experts across AFCEC have responded to about 10,000 requests. The AFCEC team is dedicated to receiving questions and requests, and answering and tracking responses to field organizations in support of mission execution across the full operational spectrum. The RBC is a cornerstone of CE DASH, providing easy inquiry submittals and online responses to questions from the field when the self-help of CE DASH doesn't answer the question.

We are proud of how far CE DASH has come and look forward to seeing where we go next. We can't wait to see what the future holds. In fiscal 2019, we will continue to provide direct support to the bases by adding new CE DASH tools and features.

If you haven't yet, try out CE DASH at https://cs2.eis.af.mil/sites/10159/ (common access card-enabled; select your email certificate to access).

INNOVATION

Agile, innovative Airman Engineers enhancing air, space and cyberspace operations across the globe.