ENGINEER

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U.S. Army Engineer School

(573) 563-6192

COMMANDANT
COL Stephen J. Kolouch
(573) 563-6192, <stephen.j.kolouch.mil@army.mil>

ASSISTANT COMMANDANT (AC)
COL Chad M. Ramskugler
(573) 563-8104, <chad.m.ramskugler.mil@army.mill>

DEPUTY COMMANDANT (DC)
Dr. Shawn P. Howley
(573) 563-8080, <shawn.p.howley.civ@army.mil>

REGIMENTAL COMMAND SERGEANT MAJOR (RCSM)
CSM Zachary R. Plummer
(573) 563-8060, <zachary.r.plummer.mil@army.mil>

REGIMENTAL CHIEF WARRANT OFFICER (RCWO)
CW5 Willie Gadsden Jr.
(573) 563-4088, <willie.gadsden.mil@army.mil>

DEPUTY ASSISTANT COMMANDANT (DAC)–USAR
COL Andrew W. Rigor
(573) 563-8045, <andrew.w.rigor.mil@army.mil>

DEPUTY ASSISTANT COMMANDANT (DAC)–ARNG
LTC Michael W. Bailey
(573) 563-8046, <michael.w.bailey18.mil@army.mil>

CHIEF OF STAFF (CoS)
LTC Margaret S. Maasberg
(573) 563-7116, <margaret.s.maasberg.mil@army.mil>

DIRECTOR OF TRAINING AND LEADER DEVELOPMENT (DOTLD)
COL Adam W. Harless
(573) 563-4093, <adam.w.harless.mil@army.mil>

DIRECTOR OF ENVIRONMENTAL PROTECTION AND MANAGEMENT (DEPM)
Mr. Jared L. Johnson
(573) 563-7643, <jared.j.johnson.civ@army.mil>

COUNTER EXPLOSIVE HAZARDS CENTER (CEHC)
COL Jodie L. Kunkel
(573) 563-8142, <jodie.l.kunkel.mil@army.mil>

U.S. Army TRAINING AND DOCTRINE COMMAND (TRADOC) PROPONENT OFFICE–GEOSPATIAL (TPO-GEO)
COL James D. Scott
(573) 563-8263, <james.d.scott14.mil@army.mil>

Maneuver Support– Capability Development Integration Directorate (MS-CDID)
Mr. Damon M. Yourchisin
(573) 563-8193, <damon.m.yourchisin.civ@army.mil>

MSCoE, FFID
Mr. Larry G. Lazo
(573) 563-6282, <larry.g.lazo.civ@army.mil>

MSCoE FFID, ENGINEER DOCTRINE BRANCH
LTC Aaron F. Anderson
(573) 563-4152, <aaron.f.anderson2.mil@army.mil>

MSCoE FFID, ORGANIZATIONAL BRANCH
LTC Jeremy W. Wheeler
(740) 827-2716, <jeremy.w.wheeler8.mil@army.mil>

By Order of the Secretary of the Army:

RANDY A. GEORGE
General, United States Army
Chief of Staff

Official:

MARK F. AVERILL
Administrative Assistant
to the Secretary of the Army
2503706

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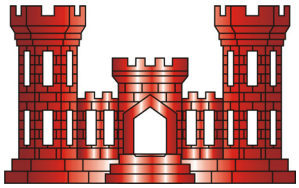

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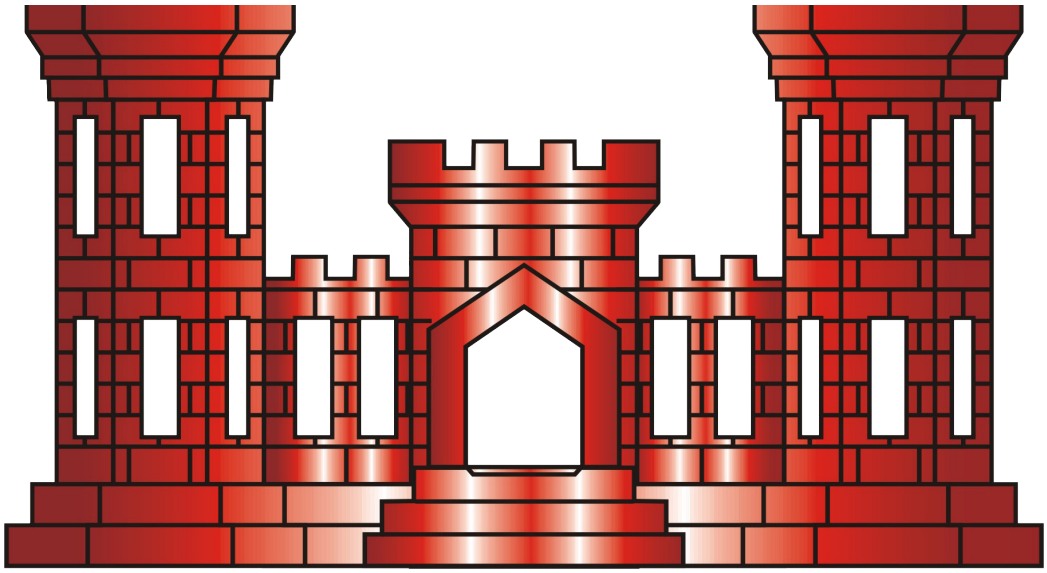
COMMAND ARTICLES

FEATURES

*MSCoE Iron Pen winner



Front and back cover: U.S. Army photos

Clear the Way

Colonel Stephen Kolouch

101st Commandant, U.S. Army Engineer School

A Mandate to Transform

All of us must have the same sense of urgency about transforming our Army to meet the needs of our Nation. The good news is: I know we can do this together. We are serious about change. Talking about it is not enough. Warfighting is our number one priority. We have to do it as fast as we can.

—General Randy A. George, Chief of Staff of the Army[1]

As we approach the 250th anniversary of the Engineer Regiment, I am honored and grateful to serve as the 101st Commandant of the U.S. Army Engineer School (USAES), Fort Leonard Wood, Missouri, and to endorse this annual issue of *Engineer*. While it is tempting to look backward (when the content within this annual issue was created), we must look forward. Using our bulletin for this purpose is fitting, as communication within our Regiment is crucial in order for us to rise and meet the challenges that we face this year.

We inherit a world marked by competition, crisis, and global conflict. To even the casual observer, the character of conflict is changing rapidly; the current pace of change is spurred by the proliferation of unmanned aerial and ground systems, sensors, remote and autonomous systems, and electronic warfare. It is clear that those who learn and make decisions faster are better prepared than their foes in future combat. To the combatant, those who more quickly adapt to the changes are the ones who survive and prevail. But what do we choose to observe, how do we learn, and what decisions do we need to make? Today's transparent battlefield, documented by myriad sensors and videos, offers abundant information. In fact, there is so much data available that it is more important than ever to sift through and discern what needs to be learned.

Our Regiment finds itself in an Army that is in a race to transform to meet current and emerging world threats. The Army considers this mission to be in continuous transformation along three time horizons:

- **Near**—transformation in contact.
- **Mid**—deliberate transformation.
- **Far**—concept-driven transformation.

As the Army is transforming, so too is the Engineer Regiment.

The Army approaches the 1-year mark of Transformation in Contact 1.0 having experimented with new capabilities and organizational concepts within three infantry brigade combat teams and publicly announcing its intent to expand this effort to armored brigade combat teams and Stryker brigade combat teams this year. Meanwhile, units such as the 20th Engineer Brigade, Fort Bragg, North Carolina, and the 36th Engineer Brigade, Fort Cavazos, Texas, are accelerating efforts in breaching and human-machine integration. USAES is advancing the Engineer Regiment, working closely with the capabilities development, acquisition, and test communities to sustain the capabilities that we rely on today and to develop the capabilities that we need for the future fight.

Although materiel is essential, it is important to understand that the Army is not just on a mission to buy new things. We must aggressively make changes across doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P). What works? What doesn't work? What must we train? What should we invest in? What should inform doctrine? How should we organize? What should we stop doing?

To effectively observe, learn, and make decisions in this fast-paced world, the Engineer Regiment must leverage one of our greatest strengths—our network. We must discuss and share observations, lessons, and best practices to coherently move forward. We have engineers around the world who are engaged in being ready to fight today and transforming to fight

in the future. We have engineers who are forward in theaters, conducting regionally aligned force deployments, training at combat training centers, experimenting with human-machine integrated formations, and participating in Transformation in Contact initiatives. We have engineers who conduct warfighter exercises and joint exercises and who interact with militaries from allied and partner nations. We have engineers who are assigned to schools—some as students and others as instructors, facilitating and observing Army-wide training events. And we are all paying attention to ongoing conflicts and observing the emergence of new technologies and the tactics used to employ them.

The work of collaboration has already begun. We created an Engineer Innovation Forum, and we host a monthly session attended by the school; units; and the capabilities development, research, and acquisition communities. Units are organized into areas of interest among our general, combat, and geospatial disciplines. And we anticipate significant engineer participation during the upcoming U.S. Army Futures Command Project Capstone Convergence 5, the Army's signature experiment. But there is much more to be done. We must formalize our learning demands to work toward commonly understood goals. We must institutionalize necessary changes to our training and doctrine. And we need to ensure that Army National Guard and U.S. Army Reserve engineers are part of this effort.

If you are a leader in the Engineer Regiment, you are a part of this transformation. Please be an agent of change—not just a witness to it. Form your own opinions, share them, and defend them. Participate in the forums appropriate for your position, whether they be unit events or events sponsored by our Regiment. Write in order that your thoughts are recorded and not lost in the noise. Much of the conversation will be appropriate for an open audience. *Engineer* recently joined all other Army branch journals on the newly created *Line of Departure* website (<https://www.lineofdeparture.army.mil/>), which supports speedy publishing, mobile access, and audio versions of all articles.

We look forward to hosting Engineer Week 2025 at Fort Leonard Wood in April. Leaders will have ample opportunities to engage each other in conversation and move our Regiment forward. Come ready to participate!

Thank you to all engineer Soldiers, civilians, and Families.

Essayons!

Endnote:

[1]General Randy A. George, "Army Transformation Takes All of Us," Association of the U.S. Army Annual Meeting and Exposition, 15 October 2025.

Lead the Way

Command Sergeant Major Zachary R. Plummer
Regimental Command Sergeant Major

As we approach the 250th anniversary of the U.S. Army Engineer Regiment, it is time to reflect on the remarkable achievements of our sappers, mappers, builders, bridgers, divers, firefighters, and power providers. Since 1775, the Engineer Regiment has been at the forefront of our Nation, responding to armed conflict, conducting peacekeeping missions, providing disaster relief, and building critical infrastructure. The mark of the Regiment is evident in many places, and its proud history and traditions continue to shape its future. The innovation efforts of engineer units—focusing on modernizing equipment, technologies, and training methods—are remarkable, and the Engineer Regiment is playing a pivotal role in changing the U.S. Army for the future.

The Systems and Training Integration Division Directorate (STID) Directorate of Training and Leader Development (DOTLD), U.S. Army Engineer School, Fort Leonard Wood, Missouri, has created the U.S. Army Engineer Training Library on Microsoft Teams,© (<https://armyeitaas.sharepoint-mil.us/teams/U.S.ArmyEngineerTrainingLibrary/SitePages/OnlineEngineerLibrary.aspx>). The Teams page is meant to give young leaders access to relevant information to help develop comprehensive training plans at the squad, platoon, and company levels. You will find training and supporting documents for our engineering systems here. If you click on the "Engineer Blackboard Training" tab at the top of the Teams page, it will take you to a page displaying the courses that we currently host on Blackboard.© If you do not see what you are looking for, click the "Files" tab. It will open another tab with file folders that align with our engineer branch. If you open a file folder (the "Construction" folder, for example), you will find subfolders for systems with shared content. Whether an operator technical manual, operator new-equipment training material, or individual tasks, if it's in the files, STID has loaded it to share with you. If you cannot find what you need, please email the STID team at <STID_FLW@army.mil>.

March and April 2025 will be an exciting time for the Engineer Regiment at Fort Leonard Wood, as the—

- 2d Annual Best Mapper Competition will be held from 28 to 31 March 2025. The Best Mapper Competition assesses our mappers' physical, mental, and technical skills.
- Best Mapper Awards Ceremony will kick off the Geospatial Engineer Working Group on 31 March 2025.
- Report date for the 18th annual Lieutenant General Robert B. Flowers (Retired) Best Sapper Competition participants is 22 April 2025, and the competition will run from 25 to 29 April 2025, marking the 40th anniversary of the Sapper Leader Course.
- Engineer Total Army Planning Exercise is scheduled for 25–27 April 2025. This exercise will unite members of all components, U.S. Army Corps of Engineers (USACE) personnel, civilian professionals, and our Families to highlight the best of our Regiment over the last 250 years.
- Regimental Week and the Field Force Engineering Workshop will take place 28 April–2 May 2025.

As we celebrate the 250th anniversary of the Engineer Regiment, we honor the dedication and sacrifices of its members. The Regiment's commitment to innovation, modernization, and excellence will continue to shape its future. We thank all those who have contributed to the success of the Engineer Regiment and look forward to the exciting events and milestones ahead.

Essayons!!!

Show the Way

Chief Warrant Officer Five Willie Gadsden Jr.
Regimental Chief Warrant Officer

Fellow engineers, the U.S. Army Engineer Regiment has demonstrated its unyielding commitment to enhancing technical expertise and operational readiness across the Army over the past year. The successful direct commissioning of 11 noncommissioned officers to chief warrant officers two has significantly increased the Regiment's technical capacity, bolstering mission effectiveness across all formations. This remarkable achievement highlights the dedication of the Regiment to leveraging talent and creating opportunities that drive innovation and excellence.

Additionally, the Regiment has pioneered the establishment of warrant officer assignments within the U.S. Army Corps of Engineers civil works districts. These assignments provide district engineers the ability to address complex portfolio requirements. Several districts have embraced this initiative, ensuring that the Corps is strategically positioned to meet future demands with precision and expertise.

Looking ahead, the warrant officer cohort is preparing for the fiscal year (FY) 2025 chief warrant officer three, four, and five promotion selection board, a transition to the Army Modernized Selection Board System. This shift represents a pivotal evolution in career management, reinforcing transparency and promoting excellence.

Lastly, on 15 October 2024, the Regiment celebrated an extraordinary change of command ceremony, marking the transition from Chief Warrant Officer Four Russell M. Fratello to Chief Warrant Officer Four Micheal W. Dugan. This critical transfer of leadership underscores the importance of continuity as Mr. Dugan sets the conditions for the U.S. Army Engineer School (USAES) 3d- and 4th-quarter FY 25 accreditation evaluation requirements. The progress of the Engineer Regiment and its vision toward warrant officer expertise exemplify its steadfast commitment to sustaining operational superiority and readiness. I wish you all a great start to the New Year.

Essayons! We Will Succeed!

Open Data Sources in Support of Engineer Reconnaissance

MSCOE Iron Pen Winner

By Staff Sergeant Richard B. King

As brigades and below compete for dwindling engineer capabilities, open-source geospatial data can be leveraged to supplement traditional technical analysis methods in support of engineer reconnaissance missions.

In early 2024, the U.S. Army announced its proposal for restructured divisions to meet the challenge of large-scale combat operations. One of the most immediate and publicized effects of this force design update was a consolidation and net reduction of engineer assets, repurposed to support increasingly higher echelons. Previous contributors to *Engineer* have concurrently noted that engineer reconnaissance will play a critical role in the future battlespace.[1] Army Techniques Publication (ATP) 3-34.81, *Engineer Reconnaissance*, provides a prescient observation of the second-order effect, stating, "The engineer contribution to operational success is highly desired by the commander. Demands for engineer reconnaissance support will often exceed capabilities. These capabilities are spread thin, and they compete with the commander's needs for other engineer applications."[2]

Current engineer reconnaissance doctrine acknowledges the role of geospatial engineers in supporting technical analyses of infrastructure and the physical environment. To that end, open-source geospatial data that is normally used to create broad-spectrum mission analysis products can be leveraged to provide commanders and other engineers with a baseline level of awareness. This enables the development of collection requirements for environmental and site-specific reconnaissance, which, in turn, allows divisions to more effectively prioritize limited capabilities.

This article provides an overview of areas in which open-source geospatial data can be used to support engineer reconnaissance efforts, both with and without the assistance of geospatial engineer teams. Some of the data repositories (where noted) are accessible only by using a common access card; while not truly "open" in the literal sense, these repositories are, nonetheless, available to all Soldiers who request their use at the unclassified level.

Lines of Communication

OpenStreetMap© data can serve as a starting point for building situational awareness of road and rail networks in areas of operation. OpenStreetMap is a fusion of worldwide transport data derived from surveys, aerial and satellite imagery, and other open-source geospatial data. Users can view the width, number of lanes, and surface characteristics of roads or track the gauge and electrification status for railways without the need for additional processing through a web-based map interface.

OpenStreetMap data also feeds into a National Geospatial-Intelligence Agency online platform (currently known as the Open Mapping Enclave) that allows any user to update route data and status, improving the baseline for every unit. A newer platform, now under development, will most likely be given a different name going forward.

Airfields and Seaports

The National Geospatial-Intelligence Agency maintains two separate databases containing basic engineering characteristics of airfields and seaports. The Aeronautical Content Exploitation System, a map-based website, allows users to view the location, maximum runway length, and maximum runway width of any airfield on record, which allows engineers to make an initial assessment of the capability of an airfield to support different airframes. The World Port Index, available both as a map-based website and a physical publication, contains information on maximum ship size, entry restrictions, and availability of support facilities (such as cranes and cargo holding areas) at seaports.

Soil Classification

Despite a wide range of applications in support of engineer reconnaissance, open-source data on soil characteristics is not always easily accessible. The most readily available global databases, SoilGrids©[3] and the Harmonized World Soil Database©,[4] categorize soil according to the World Reference Base (WRB)—a system that differs from the Unified Soil Classification System (USCS) favored by Army doctrine. While these databases can still be useful starting points for engineer assessments, WRB-based soil datasets require that users research the composition of each category to extract any information of value. On the other hand, the Visual Navigation dataset, produced by the National Geospatial-Intelligence Agency, is classified using USCS but requires

(Continued on page 8)

The Use of ARRK to Develop a COP at AO Victory

By Lieutenant Colonel Darryl W. Kothmann

The Automated Route Reconnaissance Kit (ARRK) has incredible potential to positively affect other warfighting functions outside of maneuver and protection. Using the ARRK to survey the Area of Operation (AO) Victory, European Command, distribution network improved the delivery of commodities to rotationally aligned forces (RAF) and served as a passive route refinement asset. Simply put, the employment of ARRK by the 3d Infantry Division Sustainment Brigade (3DSB), Fort Stewart, Georgia, synchronized mobility, distribution, and route refinement, significantly increasing shared understanding of the AO and ultimately creating safer conditions for Soldiers and civilians.

ARRK

While deployed as the RAF division sustainment brigade assigned to V Corps in AO Victory, 3DSB executed frequent distribution missions, covering more than 3,000 kilometers in eight countries. The diversity of military and governmental agencies governing 3DSB movements provided a diverse problem set, particularly for moving military vehicles and commodities.

Movement throughout each of the countries in AO Victory is governed by a separate national movement coordination center (NMCC). The NMCCs are responsible for arranging clearances for all troop movements, and they frequently direct the exact routes of convoys. The rules and regulations governing the selection of routes are just as diverse as the roadway conditions between countries.

Not only do roadway conditions and traffic regulations differ between countries; they also vary within a single country. Roadway conditions frequently fluctuate between cities and villages. Rural roadways are often restrictive and navigation with military equipment complex. Heavy trucks, trailers, and recovery assets further impact the constrained infrastructure throughout AO Victory. And after drivers and vehicle commanders become familiar with the obstacles along their assigned portion of the distribution network, they are replaced by another RAF unit that must go through the same learning process. Failure to adopt a common operating picture (COP) between stakeholders further complicates the process.

When 3DSB arrived at AO Victory, no COP of the routes comprising the distribution network had been assembled. Additionally, routes selected by the NMCC often contained obstacles that were unsuitable for the type of equipment necessary to execute the mission. Military vehicles often exceeded the height restriction imposed by an overpass or the turn width available at an intersection. Poorly selected routes resulted in vehicle accidents, equipment damage, risk of injury to personnel, and delayed delivery of commodities. 3DSB identified the need to properly assess the status of each route; reach a shared understanding between the RAF DSB, the NMCCs, and the other RAF units operating in AO Victory; and produce a distribution COP between stakeholders.

3DSB requested two ARRKs from the U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, Mississippi. The primary components of the ARRK consist of a laptop computer and dashboard camera, both of which are simple to install on any vehicle. And Soldiers in any military occupational specialty and without any engineering experience can be trained to use the ARRK, which passively collects data on roadway conditions and obstacles as a vehicle is traveling. The data collected is sent to ERDC and compiled into a file. Brigade geospatial intelligence analysts can then transcribe the ERDC file onto a map. Once 3DSB had the ARRKs on hand, it began formulating a plan for employment.

3DSB integrated the ARRKs into existing distribution missions by collecting data on obstacles throughout the distribution network in order to eventually build a COP to be used by 3DSB, the NMCCs, and other RAF or North American Treaty Organization units. Each route within the distribution network was assigned a name that all stakeholders used as a reference. ARRK data was also used to advise the NMCCs on route selection for planned convoy movements. The initial data collection through existing distribution missions was successful, resulting in further demand for additional collection.

Employment of the ARRKs eventually drifted from integration into existing distribution missions to utilization of nontactical vehicle (NTV) movements planned specifically for data collection. Constraining the ARRKs to existing missions limited the frequency and speed at which the ARRKs

could collect information. Compared to the heavy DSB equipment, NTVs can travel longer distances, make fewer stops, and better navigate obstacles. In addition, NTVs are not limited by dictated NMCC routes and could be used to collect information along proposed alternative routes. With the ARRKs resourced and missions specifically designed for data collection, 3DSB was ready to begin compiling the COP.

The ARRKs collected data on roadway width, underpasses, chokepoints, restrictive turns, bridges, and other obstacles along routes throughout AO Victory. Data received from ERDC was processed by brigade security analysts and their assigned geospatial intelligence analysts. The security analysts named the routes between the nodes, selected alternative routes for recommendation to the NMCCs, and compiled all route names onto a single COP for AO Victory. The COP is now being presented to NMCCs and command posts at echelon to achieve shared understanding and implementation throughout AO Victory.

3DSB used the ARRKs to complete a survey of a massive distribution network in AO Victory in less than 3 months, and its new knowledge of the AO improved brigade readiness in the event of escalation to an armed conflict within theater. The favorable implication to other theaters is obvious and profound.

Once adopted, the distribution COP for AO Victory will assist NMCCs in selecting the most appropriate routes for the types of equipment assigned to convoys and provide RAF and North American Treaty Organization units with a planning resource for moving personnel and commodities throughout AO Victory. It will also create a common language and a shared understanding of the AO for route planners and command posts at the AO. Finally, it will reduce the number of incident reports and accidents, ultimately creating a safer operating environment for Soldiers, civilians, and partners in the AO. The ARRK has made all objectives possible.

The COP, made possible by the ARRKs, will synchronize mobility with distribution by exploiting the most underrated collection asset in the engineer inventory. The ARRK is easy to resource, train, and employ. Unfortunately, it's a capability employed primarily by engineers alone—even though neither an engineer designation nor engineer knowledge is required to request an ARRK from ERDC. The Engineer Regiment owes the warfighter greater knowledge and a better understanding of the ARRK capability.

Lieutenant Colonel Kothmann is the deputy district commander for the U.S. Army Corps of Engineers Galveston, Texas, District. He holds a bachelor's degree in history from the University of South Florida, Tampa, and master's degrees in geological engineering from the Missouri University of Science and Technology at Rolla and operational studies from the U.S. Army Command and General Staff College, Fort Leavenworth, Kansas.

("Open Data Sources . . . ," continued from page 6)

common access card access. Furthermore, unlike the other data sources mentioned, the Visual Navigation dataset is not easily visualized and requires geospatial engineer support for full display. The choice of which soil classification dataset to use will, therefore, depend on the time and personnel available.

Limitations

The use of open-source geospatial data to support engineer reconnaissance may create additional challenges. The open sources may present the data just as it was collected, without any of the edits necessary for clarity, thereby requiring further analysis before use. The sources may not be well known outside a specific field of study; uncovering those mentioned in this article required a dedicated search or the author's prior knowledge. Web interfaces for viewing the data available are not always intuitive, even for the geospatial engineers whose job it is to process such information for use by staff. Users should allocate time to familiarize themselves with the data sources well before their unit prepares to deploy or consult with their brigade geospatial team to mitigate these limitations.

Any open-source database is a continuously evolving product that is unlikely complete in every aspect. Open-source databases should be viewed as supplements to traditional methods of technical analysis—never as substitutes.

Conclusion

Open-source geospatial data can be a significant time saver when used to support engineer reconnaissance. Much of the hard work on the technical analysis of infrastructure and the physical environment has already been done worldwide. With the assistance of geospatial engineers, it can be leveraged for the benefit of the Army at a time when the demand for engineer capabilities is expected to keep growing.

Endnotes:

[1]Nicholas W. Hill and Tabb D. Patrick, "The Future Role of Engineer Reconnaissance in Large-Scale Combat Operations," *Engineer*, 2024 Annual Issue.

[2]ATP 3-34.81, *Engineer Reconnaissance*, 1 March 2016.

[3]*Soil Grids*, <https://soilgrids.org/>, accessed on 7 January 2025.

[4]"Harmonized World Soils Database Version 2.0," *GAEZ Data Portal*, <https://gaez.fao.org/pages/hwsd>, accessed on 7 January 2025.

Staff Sergeant King is a senior geospatial engineer sergeant at the 2d Security Force Assistance Brigade, Fort Liberty, North Carolina. At the time this article was submitted for the Maneuver Support Center of Excellence Iron Pen Competition, he was attending the Engineer Senior Leader Course at Fort Leonard Wood, Missouri. Staff Sergeant King holds a bachelor's degree in international relations from the London School of Economics and Political Science, London, England.

ENGINEER RECONNAISSANCE:
TECHNICAL SKILLS IN THE RECONNAISSANCE FIGHT

By Major Andrew C. Provonche

The purpose of engineers on the battlefield is to enable maneuver commanders to accomplish their missions while simultaneously protecting their forces. This constitutes a broad scope of actions that can be both awe-inspiring and fear-inducing. As war has continued to evolve, certain tasks within the engineer scope may have atrophied and may now need to be relearned and revalidated. One such task involves the ability of combat engineers to successfully conduct reconnaissance while supporting tactical operations. Referencing lessons learned at the National Training Center (NTC), Fort Irwin, California, this article examines how engineers must reinvigorate their ability to train and outfit engineer reconnaissance teams (ERTs) in support of large-scale combat operations.

Note: *For the sake of anonymity, names and timeframes have been omitted from the following vignette; however, the vignette was developed from more than 10 years of experience, with first-hand accounts from observers, coaches, and trainers at NTC.*

It was a chilly winter night and getting colder by the minute. As soon as the sun had set, the temperature had begun to drop and the Santa Ana Winds began their nightly trek across the Mojave Desert. The sky was crystal clear and offered an exceptionally bright view of the enemy obstacles near Red Lake Pass at NTC. Soldiers from a brigade combat team cavalry squadron methodically moved across the terrain to get a closer look. Attached to the squadron was a small team of engineers (under operational control of the brigade engineer battalion [BEB]) tasked to identify the scope and depth of the enemy obstacles. Hopefully, the information retrieved by the team would help shape the eventual breach of the obstacles within 24 hours.

Sergeant First Class Jones was the lead engineer for this operation. He had been an ERT member several times during his military career and had multiple NTC rotations under his belt. He had also been part of a route clearance platoon (RCP) on more than one occasion. During the previous couple of years, the BEB RCP had seen less use as a deterrent in conventional fights; in recent iterations, the RCP had task-organized squads into ERTs to keep them implemented and on the battlefield to support reconnaissance missions.

Sergeant First Class Jones had experienced one of his first assignments as a member of an ERT when he was just a junior Soldier in a BEB. He had been part of a rotational unit in which three ERTs had been created—each with three Soldiers under operational control of the cavalry troops to support reconnaissance missions in a hybrid threat environment. However, the cavalry troops did not utilize the ERTs as intended; instead, they placed the ERTs into javelin fighting positions for the duration of the rotation and failed to use their technical skills to support reconnaissance operations.

Six years later, Jones, along with most of his rotational RCP, was under operational control of another cavalry troop. Many of the RCP members were not well-versed in the doctrinal requirements for conducting engineer reconnaissance, nor were they equipped to conduct the mission. The platoon was to have been provided pre-position route clearance equipment and one medium mine-protected vehicle to serve as a command and control vehicle. The route clearance equipment was not received, and the unit was forced to operate from the medium mine-protected vehicle and a single organic Buffalo mine-protected vehicle. The RCP was also equipped with M24 binoculars and night vision devices so that they could traverse the battlespace at night. The terrain consisted of sandy hills, which the medium mine-protected vehicles and M1151 high-mobility, multipurpose, wheeled vehicles were able to traverse with minimal difficulty. However, the Buffalo (with its dedicated purpose to support route clearance missions) routinely got stuck, requiring external recovery assets for rescue. The engineers never got into the fight and, therefore, never had an opportunity to conduct their tasks.

Sergeant First Class Jones used the lessons he previously learned to prepare for the current rotation. With support from his company leadership, training focus was adjusted away from route clearance to concentrate instead on engineer reconnaissance. The RCP had trained on the operation of Joint Light Tactical Vehicles (JLTVs); the use of laser range finders in the Instrument Set, Reconnaissance and Surveying (ENFIRE) kits; and the development of doctrinal reconnaissance reports. It had also adapted the doctrinal reconnaissance reports so that they could be reported via the Joint Battle Command–Platform and frequency modulation radio.

Once the RCP arrived at NTC, it was broken down into two ERTs, which were then integrated with the cavalry squadron to identify enemy obstacles during the rotation. The teams initially used their JLTVs to maneuver and keep up with the cavalry squadron. However, 4 days into the rotation, the JLTVs were damaged and unable to continue for the duration of the rotation. The engineers were then integrated into the M2 Bradley dismounts of the cavalry squadron. This allowed the engineers to remain at the front with the scouts and to provide reports and information concerning the type, depth, composition, and intent of the obstacles on the ground to the brigade headquarters. The ERTs were used sparingly throughout the rotation; however, when they were used, the reports they generated helped provide clarity to the brigade staff prior to breaching operations. Sergeant First Class Jones was on the ground when his Soldiers first obtained visual confirmation of the obstacles at Red Lake Pass. They compiled their reports accordingly and sent their recommendations through the squadron and BEB to ensure that the information was properly analyzed at the brigade level. As a result, the maneuver forces accomplished a very successful breach the following day.

A mine-resistant, ambush-protected vehicle gets stuck while attempting to traverse a semi-improved trail at NTC.

Engineer reconnaissance is "a focused application of special or unique capabilities supporting reconnaissance, and it is applicable to all forms of reconnaissance."[1] It is important to note that engineer reconnaissance is not a form of reconnaissance; instead, it is a focused application of technical capabilities supporting reconnaissance and is applicable to all forms of reconnaissance.[2] An engineer can conduct reconnaissance in two capacities—tactical and technical. When tasked to support reconnaissance operations, engineers task-organize into ERTs. Their focus is on the collection of engineer-specific information including, but not limited to, obstacles, bypasses, infrastructure, and river-crossing sites. Doctrinally, ERTs augment reconnaissance forces to help provide engineer expertise to support mobility and countermobility operations. Enemy obstacle intelligence is often incomplete or nonexistent; therefore, integrating engineers on the ground with those involved in the intelligence, surveillance, and reconnaissance plan helps fill gaps that planners encounter.[3] Closing these gaps in the battlespace enables commanders to make more informed decisions and can facilitate information collection that may be relevant to shaping operations, such as locating support-by-fire positions and covered and concealed routes to the points of breach. This often omitted or unrefined information then gets passed down from higher headquarters to the units conducting the breach.

ERTs are tools that are available to commanders to help lift the fog of war, but they are seldom used effectively when implemented. Numerous measures can be taken to address this problem. The following recommendations stem from NTC rotational units during the past 10 years and from what observers, coaches, and trainers witnessed during that time:

- First, engineers should implement changes to their modified tables of organization and equipment—changes that would enable underequipped Soldiers to conduct reconnaissance in a mechanized fight. The ease of using RCP equipment in support of the ERT mission leaves engineer Soldiers without the proper equipment. To keep up with cavalry troops, engineers should adjust the rolling stock intended for use in large-scale combat operations fights. For example, the Buffalo—with its rear-mounted gyroscopic camera used as an early detection system—has consistently demonstrated significant difficulties traversing terrain other than improved roads. Engineer leaders should be willing to accept that risk for the RCP mission and allow ERTs to adjust the equipment to enable them to traverse the battlefield. Equipment such as JLTVs, M1151s, and medium mine-protected vehicles have allowed ERT Soldiers to stay with the cavalry troops and traverse more inhospitable terrain. Also, most of the ERT Soldiers have only basic M24 binoculars; however, over-the-counter range finders can be used to help determine the location, frontage, and width of enemy obstacles, while the new M25A1 binoculars have better magnification and offer a better field of view than the older M24 models. ERTs may be able to successfully perform the skills on which they have been trained—but if they are unable to get to the battlefield and conduct reconnaissance with the proper equipment, those skills are moot.
- Second, engineer organizations must understand the importance of with whom ERTs are integrated. Over multiple rotations, ERTs have integrated either with cavalry squadrons or with scout platoons of their maneuver brethren. The integration decision should be based on the priority of efforts in the reconnaissance fight. When ERTs assume a command relationship with cavalry squadrons, their purpose and focus are to answer the commander's critical information requirements at the brigade level. This can be in support of combined arms breaches or to help determine maneuver corridors for brigade assets. However, when they integrate with maneuver battalions, their focus narrows to support operations in their engagement area or avenue of approach. They are then utilized to enable the maneuverability of the forces of that battalion. Again, the choice is dependent on the needs of the brigade, and engineers must be ready to respond accordingly.
- Finally, the willingness of engineers to adjust their training focus can be addressed in the short term. Within the BEB, engineer companies list Task 05-CO-0410, "Conduct Reconnaissance Planning" as a mission-essential task and supporting collective task that individual platoons can conduct. However, the training itself should require coordination with cavalry troops and other key information/intelligence personnel to determine—
  - How to use eyes-on information to help shape the battlefield.
  - How to integrate with units and understand their standard operating procedures prior to arriving at NTC.
  - How to develop unique and realistic training scenarios that allow engineers to properly train on specific tasks.

Once these questions are answered, the BEB and cavalry troops will be able to truly integrate their capabilities and adjust their shortfalls.[4] With the losses of BEBs and the refocus of training efforts on large-scale combat operations, engineers are more closely scrutinized as they attempt to get to the fight and conduct their missions to standard.

The ability of engineers to adapt to current and future battlefields has always been their strength. They continue to conduct reconnaissance when supporting technical inspections of infrastructure. However, as evidenced at NTC, the fog of war stifles the ability of brigade commanders to coordinate the most complex operations (combined arms breaches) without sufficient knowledge of the obstacles and enemy forces present at breach sites. In the past, rotational units have had little to no information on the actual size, depth, and composition of the obstacles at intended breach points, leading to the destruction of their assets before they get to the breach site or rendering them unprepared to execute the breach. Fortunately, with the technology and systems now in place at NTC, units can create environments in which to conduct breaches and demonstrate the significant costs to rotational units.

Units that are selected for ERTs at NTC are currently undertrained and ill-equipped to execute their mission in a mechanized large-scale combat operations fight. But ERTs are tools that can potentially help to clear the fog of war with on-the-ground assessments from technical experts. To continue to be a combat force multiplier, engineers must ensure that the proper training and equipping of combat power occur before arriving at NTC and the battlefield.

Endnotes:

[1]Army Techniques Publication (ATP) 3-34.81, *Engineer Reconnaissance*, 1 March 2016.

[2]Ibid.

[3]Center for Army Lessons Learned Handbook No. 17-11, *Brigade Engineer Battalion and BCT Integration: Lessons and Best Practices*, April 2017.

[4]Center for Army Lessons Learned Bulletin No. 17-28, *CTC Trends FY2016,* October 2017.

Major Provonche is currently a student in the Command and General Staff Officers' Course at Fort Leavenworth, Kansas. He previously served as the primary observer, coach, and trainer for the Engineer Support Company (ESC)/Engineer Construction Company (ECC) at NTC. He holds a bachelor's degree in mechanical engineering from Norwich University, Northfield, Vermont, and a master's degree in engineering management from Missouri University of Science and Technology, Rolla, Missouri.

Brazilian Army Engineer Instruction Center

By Lieutenant Colonel Francisco Da Cas

Ao braço firme! Avante Remar! (Hey! Ho! Heave! Forward Row!)

Brazilian Army engineers act as a vital force multiplier, helping to achieve and maintain combat objectives while providing essential engineering support for military operations. They also play an important role in national development through the construction of infrastructure and support during disasters.[1]

In 2005, the Brazilian Army established the Brazilian Army Engineer Instruction Center (CI Eng/EB) next to the 1st Railway Battalion in Araguari, Minas Gerais, Brazil. CI Eng/EB was created to provide technical training in general engineering and prepare engineers for peacekeeping missions.

Expansion and Modernization

With the modernization of the Brazilian Army in the 2010s, CI Eng/EB began to expand its activities to cover various fields of engineering while also offering multiple courses to benefit the entire force. This expansion contributed to improvements in doctrine and the modernization of equipment. Current initiatives will further expand CI Eng/EB capabilities, thereby increasing its value to the Brazilian Army.

Organizational Structure

CI Eng/EB is organized into several divisions:

- Training Division:
  - Technical Teaching Section.
  - Psychological Pedagogical Section.
  - A, B, and C Training Sections.
  - Distance Learning Section.
- Planning and Doctrine and Research Division:
  - Technological Innovation Section.
  - Doctrine Section.
  - Planning Section.
- Administrative and Training Support Division.

Facilities and Coursework

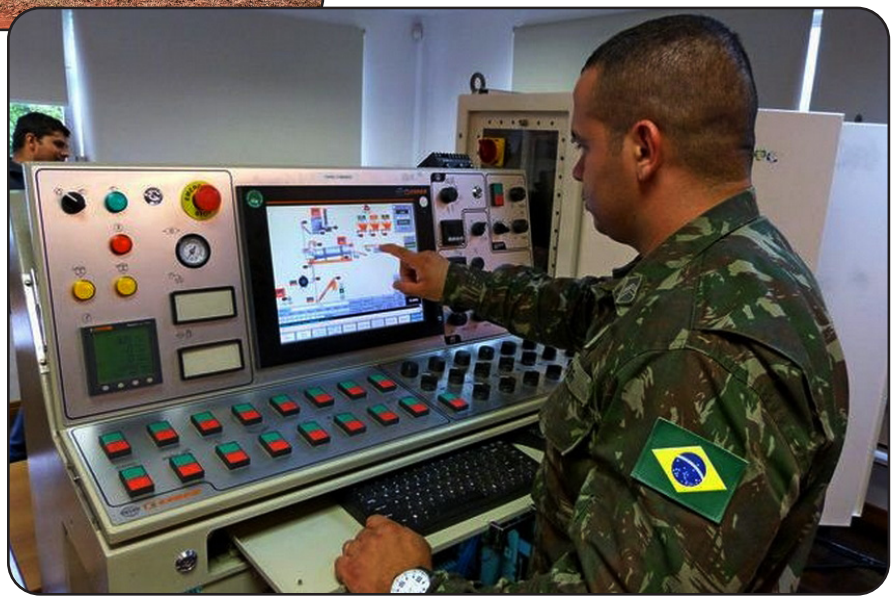
In addition to classrooms, CI Eng/EB includes construction equipment simulators; training facilities for construction activities; soil laboratories; water supply systems; and explosive-devices neutralization, demining, and diving facilities. These additional resources allow students to practice the techniques they learn in the classroom.

CI Eng/EB offers a wide range of training, including—

- Long-term courses (6 to 24 weeks):
  - General Engineering Operations Course: Qualifies officers and noncommissioned officers (NCOs) to execute construction works.
  - Heavy Engineer Equipment Course: Prepares officers and NCOs for maintenance management.
  - Site Manager Course: Qualifies NCOs for horizontal-construction site management.
  - Levels 1 and 2 Explosives Ordnance Disposal and Neutralization Course: Trains officers and NCOs in explosives management and demining.
  - Water Supply Course: Trains NCOs to manage water supplies in Army units.
- Short-term courses (1 to 5 weeks):
  - Construction Management.
  - Equipment Fleet Management.
  - Well Drilling.
  - Asphalt Paving.
  - Explosives Operation.
  - Real Estate Appraisal.
  - Soil Testing.
  - Railway Construction Training.
  - Diving Equipment Maintenance.
  - Installation Construction Management.
  - Geospatial Engineering.
  - Environmental Protection.
  - Outboard Motor Maintenance and Operation.
  - Firefighting and Fire Prevention.
  - Power Generator Maintenance.
  - Real Estate Management.

A student performs a task during the Heavy Engineer Equipment Course.

An engineer team practices an explosive ordnance disposal task supported by a robot and a mine detection dog during a multidisciplinary exercise.



An NCO operates an asphalt plant during the Asphalt Paving Course at the CI Eng/EB.

A practical portion of in the Outboard Motor Maintenance and Operation Course

An instructor evaluates the results of a bridge demolition examination during the Explosives Operation Course.

International Collaboration

Through bilateral agreements or triangular partnerships with the United Nations, CI Eng/EB has expanded its activities to offer courses for military personnel from other Services and friendly nations in North and South America, Africa, and East Timor. These partnerships strengthen international relations, showcasing the expertise of Brazilian Army engineers.

Humanitarian Demining Missions

With expertise gained from more than 30 years of experience in humanitarian demining missions, the Brazilian Army specializes in training military personnel on demining and neutralizing explosive devices. A new course to train Brazilian Army engineers, and potentially engineers from other countries, has recently been added to contribute to reducing the global threat of mines.

Future Initiatives

In 2025, CI Eng/EB will introduce the first-ever Level 3 Explosive Ordnance Disposal and Neutralization Course, conducted in English, to train army engineers and engineers from allied nations on neutralizing explosive devices.

Conclusion

CI Eng/EB plays a critical role in training general and combat engineers, as well as engineers in the geospatial and environmental arenas. It contributes significantly to generating and modernizing engineering capabilities, ensuring the effective use of engineers in various scenarios, from combat to international peacekeeping operations, across all Brazilian regions.

For more information about CI Eng/EB, see the CI Eng/EB web page at <http://www.2bfv.eb.mil.br/index.php/pt/ci-eng>.

Endnote:

[1]Francisco Da Cas, "Strong Arms/Friendly Hands: Brazilian Army Engineers Benefit to the Brazilian Nation," *Army Engineer Association Magazine*, Winter 2024, p. 23.

Lieutenant Colonel Francisco Da Cas is the Brazilian liaison officer at the Maneuver Support Center of Excellence, Fort Leonard Wood, Missouri. He graduated as an engineer officer from the Brazilian Army Military Academy, and he holds a master's degree stricto sensu in military science from the Brazilian Army Captain's School.

The Bureaucratic Bind:
How Current Administrative Requirements Hinder Warfighting

By Captain Brent M. Stout

With a larger number of "additional" duty requirements than people available to fulfill them, more than 3 dozen monthly reports to complete, nearly 100 published policies to obey, 50 directed operating procedures to follow, ever-increasing annual training requirements to satisfy, dozens of leader and Soldier certification programs to attend, and more than 300 personnel programs to implement, U.S. Army companies struggle to clear the hurdles in the way of accomplishing their top priority: warfighting.

Additional Duties

Approximately 75 additional duties are required of all Army companies, and unit commanders must assign two or more junior leaders to each duty. Assigned individuals must attend schools, participate in online training, undergo regular inspections, and create and maintain continuity binders and knowledge management systems. With this demand, companies need help finding the personnel and time necessary to handle administrative and clerical burdens while also training on warfighting tasks. While critical company functions must be fulfilled, each additional duty pulls squad leaders away from their squads and platoon leaders away from their platoons. Key leaders at the company level are stuck behind computers for most of their workdays and many days off, just trying to keep up.

Some of the most commonly known additional duties required of all companies across the Army include unit armorer, master driver, equal opportunity leader, and sexual harassment and assault victim advocate. These and other duties, such as communications security custodian, government purchase card holder, unit movement officer, and hazardous material endorsement officer, require extended specialized training, which is often held at the corps or installation level. Training and certifying a communications security custodian or government purchase card holder only to have them move to another assignment in a few months is not uncommon. Companies and even battalions must often rely on adjacent units or find ways to make do for several months, until they have their own personnel trained and certified in these vital roles.

Reporting Requirements

Apart from additional duties, companies across the Army are commonly required to submit anywhere from 3 to 4 dozen monthly reports, each requiring information gathering, preparation, review, validation, processing, submission, and storage. Completing and submitting reports can tie up the equivalent of 1 week every month for company command teams, with most reports being redundant or otherwise unnecessary. For example, the unit commander's financial report could be consolidated with the basic allowance for housing validation report and the basic needs analysis report. Other reports that could be consolidated into a single report include the unit manning report, rating scheme, alert roster, readiness roster, and Soldier and Family readiness group roster. Burdensome reports such as the troops to task report rarely provide input for actual decisions, processes, or systems; instead, they require many hours to complete every week, and they pull platoon sergeants and operations sergeants away from warfighting operations and missions. If leaders (specifically, commanders at echelon) do not understand all that is being asked of their reporting subordinates, it is easy to add yet another report, PowerPoint® slide, or meeting.

Policies and Operating Procedures

A quick scan of the Army Publishing Directorate website indicates that there are roughly 15,000 active Army regulations, directives, general orders, all-Army activities messages, technical manuals and bulletins, Army doctrine publications, field manuals, and training circulars—many of which Army leaders are expected to understand, reference, and enforce. At the unit level, commanders are expected to publish and display their own policy letters as well as the policy letters of higher echelons. Regardless of how easy it might be to copy and modify 1 or 2 dozen policy letters from the higher echelon, a lot of time is required to find, reference, update, understand, disseminate, display, and apply the abundance of policy letters and periodic updates from the company, battalion, brigade, division, corps, command, and Department of the Army.

Like unit commander policy letters, standard operating procedures (SOPs) specify how a unit will operate in its current structure under the current command. SOPs are meant to increase unit effectiveness by standardizing and streamlining operations. Army companies typically have anywhere from 12 to 20 operating procedures, with the tactical SOP, plans SOP, command post SOP, and maintenance SOP at the forefront. Other SOPs include the arms rooms, safety, supply, communications, medical, barracks, and motor pool SOPs. Unit SOPs are inspected at least annually, with some SOPs, like the maintenance SOP, reaching hundreds of pages in length. The large volume of documents that need

to be updated, inspected, and quickly referenced inundates and overwhelms company leaders and diminishes the effectiveness of operating procedures.

Training Requirements and Certification Programs

The current suite of annual training requirements includes the Threat Awareness and Reporting Program, Antiterrorism, Survival Evasion Resistance and Escape Education, Isolated Personnel Report, Cyberawareness, Network Acceptable Use Policy, Safeguarding Personally Identifiable Information, Leader's Safety Course, Family Advocacy Program, Global Assessment Tool Azimuth Check, Digital Training Management System Leader Certification, Personnel Readiness, installation People First Programs, Leader Medical Protection System, Equal Opportunity, and Sexual Harassment/Assault Response and Prevention, among others. These recurrent training requirements foster an ethically faded environment in which people are tempted to skip through the training on mute or even forge certificates of completion. Most of the required training arguably offers little or no value to Army leaders and does not directly contribute to more-prepared formations or better warfighting.

In-house leader academy and certification programs are prevalent at battalion and brigade echelons across the Army—usually in the form of squad leader, platoon sergeant, platoon leader, executive officer, and command team certifications. Army installations host consolidated courses for company and battalion executive officers with emphasis placed on the precommand course for incoming company commanders and first sergeants. The intent behind internal leader certification programs to prepare incoming leaders for their positions through information dissemination and program familiarization is honorable. The return on investments in in-house leader academies and certification programs can be high—especially with significant chain-of-command engagement and group reviews of current events and Army initiatives. Regardless, these activities still fill slots on training calendars and pull leaders away from their companies—and only marginally lead to better warfighting.

Daily Administrative Requirements

The aforementioned additional duties, required reports, policies, procedures, training requirements, and certification programs do not account for all the other daily company administrative functions and responsibilities. The largest source of administrative requirements involves personnel items such as awards, evaluations, counseling, leave processing, professional development events, physical fitness testing, height and weight testing, urinalysis testing, bars to reenlistment, Uniform Code Of Military Justice actions, signature cards, medical readiness compliance, career skills and transition assistance programs, substance use disorder clinical care, Family care plans, personnel flags, high-risk reviews, health and welfare inspections, Army Good Conduct Medals, promotions, reenlistments, motorcycle counseling, and privately owned weapon validation and approvals. Additional administrative responsibilities of the commander include reviewing training plans; creating and briefing operations orders; developing commander's inquiries; adjudicating legal actions; attending higher-echelon events such as professional development sessions and hail and farewell gatherings; accounting for property through cyclic inventories and reconciliation; and updating slides for company, battalion, and brigade meetings. There is little wonder that modern-day company commanders are primarily concerned with garrison administrative operations rather than warfighting.

The sheer number of duties, reports, policies, procedures, requirements, and programs results from fragmenting and bureaucratizing company functions to reduce risk and institutionalize consistency and redundancy at echelon. Army-wide installation and program managers and individual staff sections are quick to add additional requirements and inspections because they view their functions as independent from other company priorities, lines of effort, and training requirements. Many required additional duties such as master fitness trainer, master driver, master resiliency trainer, master marksmanship trainer, retention officer, dispatching delegate, fuel handler, and unit movement officer are components of organic duties already held by company junior leaders. For other duties associated with Army-wide systems of record such as Digital Training Management System operator, Defense Travel System operator, Global Combat Support System–Army operator, Army Records Information Management System manager, and publications officer, personnel are assigned to absorb the administrative burden. Formally institutionalizing these lines of effort creates consistency across the vast Army formation—but at the expense of adding inspections and continuity binders, filling up training calendars and, possibly, hiring and maintaining installation civilian program managers. The repercussions of possibly cutting duties like voting assistance officer; repair and utility representative; motorcycle mentor; Family, Morale, Welfare, and Recreation coordinator, fire marshall, container control officer, or credentialing assistance officer are unknown. But if everything is a priority, then nothing is a priority.

Warfighting Priority

At the April 2024 Joint General Officer Forum, held in Tampa, Florida, General Randy A. George reiterated that the number one Army priority is warfighting, stating that retaining this focus would require a culture shift away from bureaucracy and toward continuous innovation.[1] He went on to say that there is interplay between leadership and risk taking and that each additional duty, policy, report, and operating procedure is a response to a previously identified issue; therefore, strong leaders willing to take risks will be needed in order to reduce the redundant and unnecessary requirements currently distracting companies from warfighting.[2] As General George states, "We won't change things without being very knowledgeable about them."[3] Leaders at echelon will need to understand the full volume of what is being asked of companies before they can direct

change—and not just what is listed in a battalion weekly tasking order, but everything demanded from the Army, installation programs, and other external entities.

Enforced Efforts

Lieutenant General Sean C. Bernabe, previous commanding general, III Armored Corps, Fort Cavazos, Texas, took note of the expectations placed on company leaders and began considering ways to revamp the Fort Cavazos Company Commander and First Sergeant Courses to realign company priorities and reduce administrative requirements.[4] Reducing requirements and duties is difficult, as it increases risk. Certain tasks—especially those that are tied to other unit lines of effort, those that are bureaucratically convoluted, or those that are tied to unit or leader metrics of success and performance—must continue to be performed. The Chief of Staff of the Army could tell a company commander to stop inputting data into the Army's Digital Training Management System if it doesn't help the company improve warfighting; still, if that commander's battalion and brigade use that data to track training completion and assess training schedule compliance, the input is going to continue.

In September 2023, personnel from the U.S. Army Forces Command (FORSCOM) Office of the Inspector General conducted an inspection of FORSCOM units spanning nine installations and including 109 companies of 46 battalions from 26 brigades.[5] The objective of the inspection was to identify primary sources of schedule disruption and inefficiency and assess leader engagement at echelon to implement directives and initiatives from higher headquarters. The inspectors concluded that poor staff work and a lack of communication between echelons prevented commanders from providing the predictable training environments outlined in Army Regulation (AR) 350-1, *Army Training and Leader Development*,[6] and Field Manual (FM) 7.0, *Training*.[7] They found that, in order to complete administrative tasks, company leaders continued to work hours after releasing their Soldiers and that the unpredictability at echelons of battalion and below was the result of the regular publication of taskings with lead times well short of the doctrinal timelines. The inspection revealed that companies sometimes receive taskings within an hour of execution—and even after directed suspense timelines. (Even small tasks can tie up key leaders and equipment.) The inspection should have identified programs and lines of effort that distract units from their priority warfighting missions and pull them away from complying with their training plans and calendars; however, it did not. It is recommended that additional inspections be conducted to identify redundant Army programs that could be cut or offer recommendations for reducing or eliminating any Army directives or initiatives.

Conclusion

We must recognize the impact on time and materiel resources imposed by excessive administrative requirements. We can reduce these impacts by changing requirements at higher echelons and through selective focus and leader and manager competencies at lower echelons. If the Army wants to modernize and focus on improving its warfighting capabilities, then the bureaucracy must be reduced by scaling back the Army-wide directives, initiatives, and programs and decreasing administrative and clerical requirements and responsibilities at the company level. Since information requirements are directed from higher headquarters, any course corrections or systemic changes can only occur from the top down.

Warfighting has been placed on the back burner, behind the deluge of required company administrative actions, trainings, and programs. Senior leaders must take a step back to fully grasp the breadth of company functions and the scope of required tasks demanded of company leaders and decide when, where, and how to reduce them. Placing warfighting back at the forefront will require that leaders take risks through drastic cutbacks in current administrative priorities from all Army entities. When there are more additional duty requirements than people available to fulfill them, it's time to determine where cuts can be made.

Endnotes:

[1]Joint General Officer Forum, FORSCOM, Tampa, Florida, 23–24 April 2024.

[2]Ibid.

[3]Ibid.

[4]III Armored Corps tasker to 1st Cavalry Division staff, 9 April 2024.

[5]FORSCOM Inspector General Report, *Day in the Life Follow-Up Inspection*, May–September 2023, 13 December 2023.

[6]AR 350-1, *Army Training and Leader Development*, 10 December 2017.

[7]FM 7.0, *Training*, 14 June 2021.

Captain Stout recently completed an assignment as the commander of the 104th Engineer Construction Company, Fort Cavazos. He earned an undergraduate degree in mechanical engineering from the U.S. Military Academy—West Point, New York, and a master's degree in engineering management from Missouri University of Science and Technology at Rolla. Captain Stout is currently enrolled in advanced civil schooling for nuclear engineering at Texas A&M, College Station, and will follow that with a teaching assignment in the Department of Physics and Nuclear Engineering at the U.S. Military Academy beginning in the fall of 2026.

Junior Engineer Officers Need Better Training

By First Lieutenant Tyler A. Skidmore

The war in Ukraine demonstrates that combat engineers are essential game changers in the glacially paced trench warfare of the modern battlefield. Ukrainian engineer squads and platoons are critical to reducing, breaching, and clearing trenches, mines, and other obstacles on the Russian front.[1, 2, 3] These combat engineers must also be proficient in fire and maneuver, as most of their work is done while actively under fire.[4] The U.S. Army should take note of what is asked of combat engineers in Ukraine and train its engineer forces accordingly. Additionally, under the Army 2030 force redesign, engineer assets will be held at the division level—meaning that high-level maneuver commanders will determine how to best task-organize engineer units, which could move as teams, squads, platoons, or even larger units.[5] Existing working relationships between combat engineer augmentees and their maneuver companies or battalions will likely garner less respect. To meet demands, the Army will need better trained and more dynamic and adaptable junior engineer officers than ever before.

The way that the U.S. Army Engineer Branch trains its newly commissioned engineer lieutenants must be reexamined in this new light. The 19-week Engineer Basic Officer Leader Course (EBOLC) does not meet its stated objective of producing graduates "with the technical and tactical knowledge and skills that are essential to success as a platoon leader."[6] The responsibilities of the Engineer Branch are too broad and its formations too diverse to gain proficiency in these subjects in such a short amount of time, and there are few engineer-specific Army schools available for junior officers to attend. To make matters worse, most engineer lieutenants do not attend any existing engineer-specific schools before they are sent to lead the force. By comparison, the responsibilities of infantry and armor lieutenants are narrower than those of engineers, allowing those Basic Officer Leader Courses (BOLCs) to more comprehensively cover the scope of a newly commissioned lieutenant's potential duties. Lieutenants in these branches can also generally expect a battery of career-specific post-BOLC schools.

The Army must begin treating young engineer officers more like maneuver officers are treated in introductory training. First, more thorough practical instruction on maneuver and engineer-specific skills is needed during EBOLC. Second, engineers need more engineer-specific post-EBOLC instruction. Follow-on schools must be a part of the training pipeline for engineer officers, just as they are for infantry and armor officers. The solution is not simple. Such changes would require that the Army reevaluate its priorities, restructure existing schools, develop new training programs, and provide more funding and resources to support those programs. However, the cost of inaction may be higher than that of making changes; engineers have an expansive mandate, and they need the tools to properly execute.

Serving as Jacks of All Trades

The primary role of junior engineer officers in large-scale combat operations is to provide mobility, countermobility, survivability, and general engineering support to their maneuver brothers and sisters on the battlefield[7] and, if the mission requires it, to be prepared to conduct maneuver operations themselves. The EBOLC program of instruction falls short of preparing lieutenants to meet this standard.

Theoretically, EBOLC provides engineer officers with professional indoctrination, infantry common core knowledge, combat engineer fundamental skills, familiarization with general engineering, and doctrinal expertise. However, blocks of instruction are presented at a breakneck pace, with little time to practice or refine these skills. Only 1 week each is spent on critical subjects such as small-unit tactics, demolition, bridging, horizontal and vertical engineering, construction, and project management. Only a single lesson is presented on important topics as convoy operations and the employment of heavy-track engineer vehicles. Instruction on mounted operations, mechanized breaches, and route clearance is very scant, and only 2 weeks are allotted for doctrinal concepts such as offense, defense, stability operations, and maneuver task force planning.

The knowledge base that engineer officers must possess is much broader than any other branch, forcing EBOLC to be a mile wide and an inch deep. An engineer officer must be a jack of all trades, fluent in combat engineering, general

engineering, fire and maneuver, and many more areas.[8] Furthermore, there are many vastly different engineer formations (sapper, construction, route clearance, bridging) that require a wide variety of skills.[9] As a result, junior engineer officers need more preparation for their day-to-day job than lieutenants in virtually every other branch. Thescopes of responsibility for officers of other branches, such as infantry and armor lieutenants, are narrower, allowing more time to train the fundamentals in their BOLCs.

I am not suggesting that EBOLC blocks of instruction be sacrificed. In the current form of the Branch, engineers must be good at everything. To adequately train new engineer lieutenants on such a diverse set of tasks and provide them with the repetition of necessary tasks to absorb the material and skills, the solution will need to include a longer EBOLC. While the current length of EBOLC is comparable to the length of infantry and armor BOLCs, much more ground must be covered for engineers. Additionally, maneuver lieutenants are often guaranteed to receive post-BOLC training, which is not true for engineer lieutenants.

Getting Back to Basics

Engineer lieutenants need more instruction and practice in engineer-specific disciplines during EBOLC. For example, more than 1 week should be dedicated to demolition and students should be given more opportunities to apply the techniques they learn in this block to field problems. Students should also execute more than one or two breaches during EBOLC field training exercises. Likewise, bridging and wet-gap crossing also deserve more than 1 week of instruction, as the planning and execution of such operations are some of the most crucial support functions that engineer officers can offer to maneuver elements. Students should be required to build obstacles to standard and learn to use high-mobility engineer excavators, bulldozers, and loaders—not just read about them and "understand" how they could theoretically be used.

Since most engineer lieutenants will join combat engineering and direct maneuver support units, EBOLC must include more maneuver instruction. This would require more than a 3- to 4-day block of instruction on patrolling, battle drills, movement formations, and the like. Each of these topics should be covered for closer to a week, with plenty of time for repetition. Familiarization with mounted patrolling should be included. Although engineers cannot dive as deeply into maneuver tactics as the maneuver branches do, many engineer leaders will be expected to execute maneuver tasks and should rightfully prepare to do so.

Sharpening Skills

If the rationale for the exclusion of in-depth maneuver training from EBOLC were that it is available at the Sapper or Ranger Schools, that would be understandable—if these schools were attainable for most EBOLC students who demonstrate the motivation and ability to complete them. However, in most cases, these schools are out of reach for students. EBOLC does offer a train-up program for the Sapper and Ranger Schools, but it rarely leads to slots for students who complete it. The burden of sending officers to these schools is typically passed to follow-on units. Additionally, only some officers will serve in infantry-centric units; many will lead bridging platoons (with only 1 week of training), light-equipment or engineer support platoons (with little more than a week and a half of training), and so on. Strategic leaders must discuss providing resources for follow-on schools as an expected part of introductory engineer officer training.

This is not a radical suggestion. As mentioned, infantry and armor lieutenants often attend more than one follow-on school (Ranger School, the Scout Leader Course, the Maneuver Leader Maintenance Course, the Stryker Leader Course) after their BOLC. The result is that those officers are far more equipped for the technical aspects of their jobs than their engineer counterparts are. Engineers need similar expertise, and their training pipeline must reflect this necessity.

As in maneuver branches, follow-on schools for engineers should be based on the type of unit in which the officer will serve. For officers headed to a sapper unit, Sapper School should be included the same way that Ranger School is included for virtually all infantry officers. Engineers that will post with Stryker or Bradley units ought to attend the Stryker or Bradley Leader Courses directly after completing EBOLC. Engineers who will work with scout or reconnaissance units should be sent to the Scout Leader Course or Reconnaissance and Surveillance Leader Course—or they should be offered the chance to volunteer for those courses. More slots to Ranger School should also be available to engineer officers directly after BOLC, as the Ranger School is an essential developmental tool for learning and appreciating the job of the infantry—a job that engineers may be expected to execute.

Opportunities for follow-on courses are necessary for two reasons. First, engineers need an in-depth knowledge about how their maneuver formations operate and how their equipment works in order to execute their support function in a way that other enablers do not. Second, there is a much more direct expectation that engineers—not any other support function—will complete the maneuver job if the situation requires it.

For specific engineer tasks such as bridging, construction, and route clearance, I suggest that entirely new schools be established to account for training shortfalls. A "Bridging Leader Course," a "Construction Leader Course," or a "Light Equipment Leader Course" would benefit future leaders of such formations. If establishing a new school is not possible, then care must be taken to ensure sufficient training during EBOLC. Considering the strong emphasis on urban combat in military circles today, the fact that the Urban Breachers Course at Fort Leonard Wood, Missouri, was shut down is perplexing. Other courses, such as the Route Reconnaissance Clearance Course, are also shuttering due to the Army's shifting priorities.[10] This training would be

very useful to young officers who may be approached as subject matter experts—even with little actual training. A possible solution to these problems is that engineer leaders who prove themselves especially capable could attend courses meant for U.S. Marines or special operations forces (such as the Master Breacher Course) before being sent to their units.

Kicking the Can

The ideal time for advanced training is immediately after successful completion of EBOLC. It is unreasonable for the Army to entirely shunt the responsibility for sending officers to schools on to their receiving units because this is what often leads to lieutenants being denied such opportunities. Units are forced to conduct cost-benefit analyses to determine who to send to what school. Most do not have the money to freely send their officers to the schools they need or are completely at the mercy of the training calendar. Those officers who are "needed on staff" or are immediately placed into platoon leader positions are usually not sent.

However, the Engineer Branch has limited resources. If the limitation that prevents these suggested reforms is a lack of funding, then the Branch must raise this issue with strategic leadership. While the present arrangement may have previously worked, the modern environment reveals that the Army must prioritize the development of engineer leaders—potentially at the expense of readiness elsewhere.

It is also worth considering whether more radical solutions are necessary. Perhaps splitting combat engineers and general engineers into two separate Army branches, each with its own BOLC training priorities and pipelines, would reduce the sheer volume of material that both groups would need to master. These branches could then be merged back together following the Captain's Career Course in the same way that the Ordnance, Transportation, and Quartermaster Branches are merged into the Logistics Branch following their Captains Career Courses. However, if the Engineer Branch is to retain its current form, then a serious overhaul is necessary. EBOLC must provide more in-depth instruction for students, and the EBOLC instruction must be followed by additional training.

The modern battlefield has demonstrated that producing trained and flexible engineer leaders is not optional. One way or another, the U.S. Army must prioritize the development of its engineer officers—victory in modern war may depend on it.

Endnotes:

[1]"Sappers Risk Their Lives to Win Ukraine Back Inch-by-Inch," *The Economist*, 9 July 2023, <https://www.economist.com/europe/2023/07/09/sappers-risk-their-lives-to-win-ukraine-back-inch-by-inch>, accessed on 30 October 2024.

[2]Parakash Panneerselvam, "Russian Trenches Major Challenge for Ukraine's Counter Offensive," *Indian Defense Review*, 1 June 2023, <https://indiandefencereview.com/russian-trenches-major-challenge-for-ukraines-counter-offensive/>, accessed on 30 October 2024.

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[4]"How Ukraine's Sappers Pierced Russian Defensive Lines," *Times Radio*, 12 September 2023, <https://www.youtube.com/watch?v=ceTMpR00ehc>, accessed on 30 October 2024.

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[6]"Engineer Basic Officer Leadership Course (EBOLC)," U.S. Army, Fort Leonard Wood website, <https://home.army.mil/wood/units/tenants/USAES/Orgs/1stENBDE/554thENBN/EBOLC>, accessed on 30 October 2024.

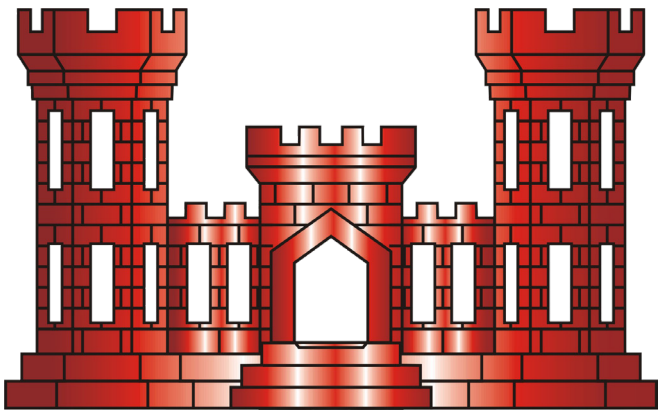
[7]Field Manual (FM) 3-34, *Engineer Operations*, 18 December 2020.

[8]Ibid.

[9]Army Techniques Publication (ATP), 3-34.10, *Engineer Platoons*, 2 February 2021.

[10]Amanda Sullivan, "The End of an Era: R2C2 Course Concludes, CEHC to Focus on New Missions," 30 September 2021, U.S. Army website, <https://www.army.mil/article/250767/the_end_of_an_era_r2c2_course_concludes_cehc_to_focus_on_new_missions>, accessed on 30 October 2024.

First Lieutenant Skidmore is an engineer currently serving as the deputy innovation officer for the XVIII Airborne Corps, Fort Liberty, North Carolina. He holds a bachelor's degree from the U.S. Military Academy-West Point, New York, and a master's degree in engineering and public policy from Carnegie Mellon University, Pittsburgh, Pennsylvania, where he worked on climate adaptation policy with the U.S. Army Engineer Research and Development Center.



Training Junior Engineer Officers:

The Way Forward

By Mr. Cody A. Fields

Editor's note: *This article presents the U.S. Army Engineer School (USAES) response to First Lieutenant Tyler A. Skidmore's article "Junior Engineer Officers Need Better Training"[1] available at https://home.army.mil/wood/contact/publications/engr_mag/Junior-Engineer-Officers-Need-Better-Training*

It is hard to argue against the assertion that all military training, regardless of the skill level or branch, could benefit from some adaptation and advancement. Leaders at all levels are responsible for assessing existing information and training methods and adapting those methods to fit the needs of the force. The ever-evolving variables of the current operational environment; advances in equipment; and new tactics, techniques, and procedures need to drive training. Furthermore, world events dictate that we have a far different focus on operational requirements than we did over the last 2 decades. This is just as true for the USAES Engineer Officer Basic Leader Course (EBOLC), Fort Leonard Wood, Missouri, as it is for training units conducting training at the operational level.

Current EBOLC Mission and Intent

To set the stage for a better understanding of EBOLC, it is necessary to outline the current parameters and goals of the course. EBOLC now consists of 19 weeks and 4 days of in-person familiarization and training of newly commissioned engineer lieutenants in the basics of military engineering. Some of the baseline concepts covered include doctrinal common core, combat engineering, and general engineering; the focus is on a brief introduction of these topics. The Engineer Regiment is so robust that it would be difficult, if not impossible, to impart complete expertise in all of these disciplines in the short time allotted.

It is difficult to precisely predict where every student leaving EBOLC will be assigned and—based on the vast set of skills required throughout the Engineer Regiment—the job that each will be doing. As a result, it is only possible to provide a brief overview of key and essential tasks throughout the course. We ask ourselves what each engineer lieutenant needs to be exposed to. And the answer is: Everything. With an "everything" mentality, the depth to which the topics can be covered is limited. We must assess where risk can be assumed based on experience and guidance from higher command.

Sharpening of Skills: Training and Education Domains

The Army functions through three training domains—institutional, operational, and self-development. The three domains support one another and, together, help build the understanding and training readiness required for success. Knowing and understanding these three domains helps close gaps or shortcomings in training/readiness. But then, who becomes responsible for what training? Training requirements that affect individual and organizational readiness are likely to be conducted in the institutional and organizational training domains. However, the question becomes more and more subjective as each domain begins "pointing its finger" at another. Now, how do we decide who is *truly* responsible?

The focus in the institutional domain lies heavily on the basics, with the primary focus on what is doctrinally correct. Courses such as Advanced Individual Training allow our Soldiers to learn and practice new tasks and skills. As Soldiers advance through Professional Military Education levels, they are exposed to more advanced tasks that build on the hands-on skills they previously learned. For EBOLC, the focus is on conceptualizing, planning, and managing the skills learned by junior enlisted and noncommissioned officers. Every effort is made to introduce students to as much as possible; however, with a vast array of topics and limited resources, it is difficult/impossible to expose students to virtually anything and everything they may experience over their careers. It would be very unrealistic to expect 100 percent hands-on experience in all engineering skills and trades.

The operational domain is where the "rubber meets the road"—where the initial institutional training and leader training come together. Field Manual (FM) 7-0, *Training*, explains how to make this effective: Train as a combined arms team, train using multiechelon techniques, train to standard using appropriate doctrine, train as you fight, sustain levels of training proficiency over time, train to maintain,

and train to fight.[2] These concepts can truly only be implemented at the operational level, and specific resources are needed for this approach to be truly beneficial. By utilizing the concepts and skills acquired during "schoolhouse" training, Soldiers and leaders can practice and become proficient in far less resource-constrained environments.

The bottom line is that the operational force holds the reins for preparing its units for the upcoming fight; individuals and leaders can sharpen their skills through realistic, relevant, and rigorous unit training. Although we would love to add as much practical application to USAES courses as possible, it is much more important that Soldiers and leaders to get the hands-on practice they need from the units with which they will fight in combat. Our goal is to provide students with as much doctrinal information as possible to set them up for success in their future assignments.

Way Forward

So, what does the future of training look like for the Army? More specifically, what are the future training requirements for EBOLC? Most of our EBOLC improvements currently stem from the experience of organizational leaders and instructors as well as student feedback throughout the course. This input—which could be dated or irrelevant, based on individual experience levels—results in subtle changes over time. What would be truly beneficial is input from the force. Former graduates could relay information about what they are currently doing or suggest topics for which a deeper understanding would have been more helpful. This is the only way that we can improve things—but it is not happening. Instead, Soldiers and leaders are leaving their institutional training and taking no ownership in improving the educational process for the future. They are complaining about how bad their training was rather than helping to improve it. The focus should be on the needs of the future to ensure that follow-on Soldiers and leaders have the tools that they will need to be successful.

USAES is taking steps to improve its courses. Critical task site selection boards for EBOLC and the Engineer Captains Career Course were held in January 2025. These boards will consist of field grade officers currently serving in the operational force across the Regiment. They will provide their input on what training is truly critical for engineer lieutenants and captains headed to platoon leader, company command, and staff positions. These boards will generate new objectives, lessons, and tasks for these courses.

Endnote:

[1]Tyler A. Skidmore, "Junior Engineer Officers Need Better Training," 17 December 2024, <https://home.army.mil/wood/contact/publications/engr_mag/Junior-Engineer-Officers-Need-Better-Training>, accessed on 23 January 2025.

[2]FM 7-0 *Training*, 14 June 2021.

Mr. Fields is an engineer tactics training specialist with the Department of Instruction, USAES. He holds a bachelor's degree in organizational leadership from the University of Missouri–St. Louis.

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