Expeditionary Engineer Mission Force

By Lieutenant Colonel Michael P. Crall

On a cold day in March 2004 at Fort Bragg, North Carolina, a telephone rang in the headquarters of the 27th Engineer Battalion (Combat)(Airborne), and a voice on the other end outlined a requirement to enhance the maneuver of a joint task force (JTF) that was taking the fight to the enemy along the Afghanistan-Pakistan border. The mission was to rapidly deploy by air with a tailored battalion engineer mission force (EMF) to construct a forward operating site (FOS) in a remote area of Afghanistan. Site capabilities must include a C-17 airfield with the ability to land several C-17s simultaneously, accommodate several rotary-wing aircraft, and include a matted taxiway; an 80,000-gallon forward area arming and refueling point (FAARP); and a base camp.

"Can you do it?" asked the JTF liaison officer (LNO). "And by the way, this is a nonpermissive environment, the road network is virtually nonexistent, you must have an airstrip that allows a short takeoff and landing (STOL), and your mission force must secure itself."

"Sounds like a challenge. But why the Tiger Battalion?" asked the command representative.

"I forgot to mention that the only way to get the engineer equipment in there is by parachute," responded the JTF LNO.

"Our motto is, 'To do all things well'," replied the command representative. "When do we leave?"

And so began the short-fuse planning to establish FOS Carlson in Afghanistan, with the goal of providing the supported JTF freedom to maneuver and operate in this austere, high-altitude region; it was expeditionary engineering at its best.

Versatility

The 27th Engineer Battalion had been supporting the Global War on Terrorism on many fronts since 11 September 2001. Having provided support to the 3d Ranger Battalion, 75th Ranger Regiment, during an airborne seizure of an airfield in Iraq and an area mine-clearing mission for the Combined Joint Task Force-180 in Afghanistan, the battalion was now supporting the 82d Airborne Division in Iraq and a U.S. Southern Command mission in Honduras. To execute the new mission, an engineer force had to be organized—using the uncommitted battalion assets and JTF combat enablers/forces—to form a combined arms team that could secure the terrain and construct and sustain an FOS.

A C-17 taxiing on the ramp parking area

The multifunctional engineer capability and deployability of the corps combat airborne organization made the 27th the unit of choice to form the nucleus of the mission force. With each line company consisting of two combat engineer platoons, a light equipment platoon, a maintenance section, and a headquarters section, flexibility is a hallmark of the force structure. Additionally, the Headquarters and Headquarters Company includes a vertical construction platoon, a medical section, a support platoon, an organizational maintenance section, a direct-support maintenance section, and staff elements that add to the battalion's multifunctionality. The deployment capabilities are also critical: an ability to strategically deploy by air, conduct a parachute insertion of equipment and personnel, and tactically move personnel and equipment by rotary-wing assets.

Given the mission requirements and assets that were deployed to support other missions, an EMF using the available assets was essential. The troops that were to design

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Paratroopers onboard a CH-47 en route to secure the DZ

the force began by using specified tasks, which were refined based on requests for information and intelligence, surveillance, and reconnaissance (ISR) data gathered from the task force. The EMF-specified tasks were to—

- Protect the force.
- Rapidly deploy by air to multiple intermediate staging bases (ISBs) in Germany and Afghanistan.
- Conduct a rotary-wing assault to secure a drop zone (DZ).
- Execute a parachute drop of an airfield construction package by C-17 aircraft.
- Employ a ground assault convoy (GAC).
- Construct a STOL airstrip; upgrade to C-130 assault landing zone (ALZ) capability.
- Construct a C-17 ALZ, taxiway, and cargo ramp.
- Construct a heavy landing zone taxiway with AM2 matting and staging area.
- Construct an 80,000-gallon FAARP.
- Construct a base camp with life support.
- Provide command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR); force sustainment; and JTF liaison.
- Provide engineer support to the JTF.

With the remaining uncommitted battalion assets, the EMF was formed around the battalion headquarters, Charlie Company, and Headquarters and Headquarters Company. The EMF task breakdown was evident: Charlie Company would secure the force, Headquarters and Headquarters Company would build and sustain the FOS, and the battalion headquarters would provide C4ISR and liaison to the task force.

Additionally, the task force provided combat enablers to operate as a combined arms team to include a U.S. Air Force Special Tactics Squadron for the Air Traffic Control, joint fires, tactical unmanned aerial vehicles, and an ALZ assessment; an information operations team; a civil affairs team; a FAARP team; an air liaison officer; a joint communications support element; and an embedded British Broadcasting Corporation/ public affairs team. On order, the task force would provide additional combat forces for both fire support and ground maneuver, as the threat evolved.

Deployability

With the personnel and equipment ready, plans refined, equipment rigged to airdrop, and mounted rehearsals completed on similar terrain at Fort Bragg, the EMF deployed via C-17 to the ISB at Baghram Airfield, Afghanistan, while C-17s with the airdrop engineer equipment staged at an ISB in Germany. Because of the time-sensitive nature of the mission, a battalion assault command post was sent to Baghram Airfield to refine the plan as the force closed. Since there was no time for a predeployment site survey, the task force focused ISR assets to facilitate battlefield visualization. This included not only the enemy situational template but also detailed terrain analysis along with in situ soil conditions to ensure that we could construct the FOS—specifically the ALZ. We had detailed digital terrain products of the area, which allowed us to see the battlespace and effectively array initial-entry security forces on the objective. Refinement of the EMF occurred until the wheels went up on the last aircraft to ensure package fidelity based on the ISR pull. With a limited number of deployment aircraft, all C-17s were filled to maximum capacity. This constrained airlift drove the organization of the EMF considerably, requiring the right mix of equipment and personnel to execute the mission with

the proper redundancy—especially with the airdrop of equipment.

The additional task force assets were integrated into the EMF as final troop-leading procedures took place. Reception, staging, onward movement, and integration (RSOI) and force closure at Baghram Airfield took 3 days, giving paratroopers a chance to get acclimated and perform final precombat checks and inspections and rehearsals. Refinement of the plan continued with the task force—specifically the rotary-wing assault and airdrop operation—to ensure the survivability of the platforms into the small DZ, which was surrounded by wadi complexes and 6,200-foot ridgelines. Briefbacks and rock drills of the plan were provided to the JTF commander to ensure the seamless synchronization of fires, C4ISR, and maneuverability. The evening before initial entry, paratroopers gathered around a football-field-size terrain model of the objective to view the final rock drill. The stage was set; the force, ready; the weather, ideal; and all understood the task and purpose of the mission.

The EMF deployed to the objective area by rotary-wing assault, GAC, heavy-equipment airdrop, and airland operation. Battalion personnel boarded CH-47 and MH-53 aircraft for the initial entry. Tasks of the initial-entry force were to secure the objective area, establish the DZ, and lay out the survey control points for the airstrip to facilitate construction of the ALZ. AH-64s were added to the initial-entry package to provide in-flight security, as well as to clear the objective landing zone. MH-47 aircraft were scheduled to bring in Class I and IV provisions to support the force.

Initial assault was executed unopposed. Upon landing, Charlie Company established blocking positions to secure the DZ, while the survey team established the ALZ geometry. The battalion assault command post established secure voice and data communications with the task force while controlling ISR and close air support assets to support initial-entry security operations. Heavy drop of the engineer equipment was planned for after the assault—once the DZ was established and secured, the ALZ surveyed, and the light equipment derig teams staged.

On 25 April 2004, a heavy airfield construction package was airdropped from C-17 aircraft onto a 2,000- by 800-foot DZ 6,000 feet in elevation—the largest heavy drop of engineer equipment since World War II. All platforms landed safely due to the precise planning of heavy drop points of impact by the task force airlift planners, the EMF, and the Air Force Special Tactics Squadron. One grader was nonmission-capable due to three flat tires, but all the other equipment was fully mission capable. The airdrop was supported by robust fires and an ISR package to ensure C-17 survivability and the security of the ground force. Following the airdrop, derig teams swarmed to the marked platforms, expertly removing parachutes, lashings, and rigging. Forty-three hours after the last platform was derigged, a STOL Air Force aircraft landed on a newly constructed ALZ—a credit to the detailed planning, preparation, and execution of the initial-entry force. FOS Carlson was beginning to take shape. The JTF commander now had more flexibility to operate in this remote border region.

Simultaneously with the pickup zone of the initial-entry force, a GAC departed from Baghram Airfield with several wheeled vehicles. The route was more than 300 kilometers through severely restricted terrain and areas that had strong anticoalition militant (ACM) support. Each vehicle had a crew-served weapon. More than 120 personnel were in the convoy, making it a force to contend with. It was also equipped with

ALZ construction 12 hours after the airborne operation

The ALZ evolution: left, Day 1; right, Day 90, C-17 capable

the Engineer Research and Development Center Automated Route Reconnaissance Kit to assist in navigating and documenting the route. The convoy encountered traffic ramming and attempts by local personnel to board the vehicles as they passed through downtown Kabul. Unfortunately, the international security force that was tasked to man traffic control points in Kabul was called away, responding to an improvised explosive device (IED) in another part of the city. Nonlethal force and speed ensured that the convoy's passage through Kabul was successful.

After the convoy encountered additional armed groups along the route (which required that the armed personnel be detained until a coalition force arrived to verify their legitimacy), it continued through the restricted terrain. Ambushed at a choke point, the convoy focused direct fires and called for close air support to neutralize the ACM four-point attack. Through fire, maneuver, and focused air support, the militants were destroyed with no damage or injury to the convoy, and the convoy proceeded into the objective area, linking up with the initial-entry forces.

Lethality

The EMF continued to secure the objective and expand the STOL ALZ to C-130/C-17 capability. Charlie Company established platoon battle positions and a series of observation points and traffic-control points, which allowed the light-equipment platoons to operate continuously. Sappers dug in and arrayed weapon systems to defeat a direct attack or to survive an indirect attack. Traffic-control points were established due to an unimproved road passing through the objective area. This road was used by ACMs as an infiltration route to and from Pakistan and by locals passing through the region. Traffic control on the road was essential to the security of the area. Mounted and dismounted patrols; area-of-operations presence patrols; and aggressive shows of force synchronizing direct, indirect, and aerial fires were executed to prevent ACM attacks or infiltration via the FOS. The decisive operation, however, became the expansion of the STOL ALZ to allow the task force to conduct operations from the FOS. One light-equipment platoon constructed the C-130 ALZ, while another one constructed the helicopter taxiway, landing zones, and FAARP. The S3 of the technical and survey section stayed 24 to 48 hours ahead of the constructive force to finalize site layout of the ALZ, taxiways, and base camp.

As the ALZ was being expanded, the platoons encountered numerous obstacles. No water was available within 10 kilometers, and the extremely large rocks in the silt/sand material made soil strength readings difficult. Although the STOL airstrip was constructed without water, achieving the required C-130 and C-17 soil strength and surface functionality required several thousand gallons of construction water per day. A recon of an area 3 kilometers south of the site yielded a potential water source in a wadi under a lime rock outcropping. After digging a 6-foot-deep hole with a small emplacement excavator, water pooled, which allowed a water distributor to upload and deliver water to the site. The cycle time was one hour per 2,500 gallons, requiring this equipment to initially run continuously, with a mounted security force protecting the route and upload site.

Because of the large rocks that were 2 to 6 feet below the surface, dynamic cone penetrometer (DCP) readings used to determine the soil bearing capacity of the ALZ became a concern. Engineer Technical Letter 01-6 (published jointly by

the Army and Air Force) defines the standards for which small austere airfields (SAAFs) are built.[1] These standards include not only dimensional requirements but also soil strength requirements. High, potentially inaccurate DCP readings became a concern of the Air Force Special Tactics Squadron, who believed that the strength of the soil between these large rocks would not support C-130 loading. Although the EMF was experienced in ALZ construction and deemed it ready for landing, a consultation was required to determine the way ahead. Using a TeleEngineering Kit to conduct a video teleconference with the Engineer Research and Development Center in Vicksburg, Mississippi; the Air Force Civil Engineering Support Agency at Tyndall Air Force Base, Florida; and FOS Carlson, it was determined—based on analyzed data—that the ALZ was suitable for both C-130 and C-17 landings. The EMF continued construction, culminating with the assault landing of a C-130 after 2 weeks on the ground.

Simultaneous to the construction of the ALZ, the base camp began to take shape. More than 100 truck loads of a joint operational set (JOS) base camp—which included inflatable shower facilities, cots, and tents (to be used as a mess hall, a gym, an aid station, and for command and control)—and essential classes of supply were scheduled to arrive beginning on Day 3 and continue throughout the buildup. Unfortunately, the first trucks did not arrive until Day 14, requiring the sustainment of the FOS by a combination of containerized delivery system C-130 parachute drops, CH-47, and airland aircraft to bring in water, food, and fuel daily. The vertical construction platoon initially served as the assault command post security force, but with the arrival of the JOS by truck, began the construction of the base camp. With the completion of force-protection berms, initial guard towers, and bunkers, the EMF moved from foxholes to environmentally controlled Alaskan tents by Day 24—a major improvement to force protection and quality of life, especially since the temperature at the FOS reached 120 degrees Fahrenheit daily.

By Day 30, the JTF could project combat power from an expeditionary FOS to conduct operations in Afghanistan. The site was now capable of landing C-130 aircraft, parking rotary-wing aircraft on an AM2 matted taxiway, fueling rotary-wing aircraft from a 40,000-gallon FAARP, and sustaining additional personnel with quality-of-life enhancements.

Sustainability

The bottom line was that the EMF had to support (fuel, fix, feed, and sustain) itself and additional forces. This was achieved with the flexible design of the EMF and the push of logistics from the liaison team at Baghram Airfield. Due to the remoteness of the area, the maintenance platoon and the support platoon were essential to the mission success. Combining the two company organizational maintenance sections and the battalion direct-support maintenance section into one platoon, the maintenance platoon was able to sustain the equipment under harsh conditions—even with the supply hub hours away by air or days away by ground through ACM country.

The support platoon was split between the FOS and Baghram Airfield to push and receive essential supplies. The liaison team gathered the necessary supplies and pushed them via air or ground to the FOS. Due to the uniqueness of the airborne engineer equipment, reachback to Fort Bragg became essential for Class IX supplies not available in Afghanistan; just-in-time logistics took on a new meaning. Initially, a tailored Class II/III/V/IX package was airdropped during entry operations that sustained the force until linkup with the GAC. Long lead times became the norm, but the innovation of the sustainers ensured that the operation continued with no significant shortfalls. After Day 30, the base camp provided bare-bones beddown for personnel with the erection of the JOS. As trucks continuously arrived—bringing additional equipment, construction materials, and supplies—the vertical construction platoon upgraded facilities to increase quality of life and force protection.

Due to the location, finding contractors to provide basic services became impossible. Most contractors were located in Kabul, Baghram, or Kandahar and wanted nothing to do with this region. Engagement with local elders led to the hiring of laborers, water tankers, and farm tractors with trailers to augment the EMF equipment. Laborers performed tasks such as filling sandbags, burning excrement, emplacing AM2 matting, erecting tents, and removing rocks from the ALZ surface during grading operations.

Farm tractors with trailers hauled clay material to sites on the ALZ to augment the fill effort and hauled gravel from local dry riverbeds to use in the base camp and between the rotary-wing parking areas for dust control. Water trucks topped off multiple 20,000-gallon storage bags, providing the daily construction water and nonpotable water requirements. At the height of the operation, the FOS employed more than 100 local nationals, 60 tractors, 10 water trucks, and 10 pickup trucks; this economic boost to the local economy had a secondary impact—force protection. Because of this, an assistant S3 officer and noncommissioned officer were dedicated full time to orchestrate the local labor, equipment support, and contracting. The FOS became the "employment factory" for the area.

Flexibility

The area of operation was relatively small, nestled in the middle of an east-west ACM infiltration route in the porous border region of Afghanistan. Multiple dismounted ACM recon patrols, attempting to assess force disposition, approached the FOS through the wadi complexes but were defeated after brief exchanges of direct fire and airborne fires. Although the primary tasks were to build, sustain, and secure the FOS, the ability to increase security in the entire area was essential to force protection. The plan was to engage the local government and tribal elders by establishing

Soldiers examine captured enemy weapons and ammunition

weekly council meetings to discuss issues and promote coalition information operations themes, demonstrate military resolve through shows of force and presence, and economically tie our force protection with local prosperity.

This engagement plan required an engineer staff to function as a combined arms battlestaff, integrating all Battlefield Operating Systems to develop executable combat plans and orders. Raids, village cordon and searches, civil affairs village assessments, the Medical Civic Action Program (MEDCAP), mobile traffic-control points, and weapon and ammunition cache seizure/destruction were the typical operations conducted by the EMF outside the FOS. The destruction of captured enemy ammunition became a weekly task for Charlie Company, who destroyed a total of more than six tons of rockets, mines, mortars, artillery rounds, demolitions, and small arms ammunition. Nightly, FOS security battle drills (integrating direct fire from guard towers, observation points, and the quick-response force with the mortar team and aerial fires) not only kept skills sharp but also sent an audible message to the local populace not to come near the FOS.

Although not a specified task for the EMF, polling-site security for the Afghanistan presidential elections became an implied task turned essential, due to our engagement in the area. Another coalition force was tasked for election security, but local elders and voting officials turned to the EMF to secure the polling sites. In conjunction with additional coalition forces, the EMF successfully secured twelve polling sites without incident. Flexibility became the hallmark of the operation: combat engineers executing infantry tasks or destroying enemy ammunition; equipment operators using bucket loaders with forks to download C-130s; supporters refueling MC-130s or MH-53s; mechanics welding fortified post gates; or tactical operations center noncommissioned officers synchronizing JTF ISR assets to see battlespace in real time—adaptive, innovative leaders and Soldiers thinking in three-dimension and making it happen.

Conclusion

By Day 120, the FOS was built to the master-plan standard, and the 27th Engineer Battalion facilitated the assault landing of a C-17. The battalion had successfully shaped terrain to enhance the maneuver of the JTF, and the FOS enabled JTF combat operations in this remote region of Afghanistan at a time and place of their choosing. The success of this operation was due to three factors: the Warrior Ethos of the airborne engineer Soldiers, the versatile organizational structure of a corps airborne engineer battalion, and aggressive engagement in the area of operations. The paratroopers of this task force overcame seemingly insurmountable odds to execute this operation. Their drive, spirit, and tenacity shaped this piece of terrain into a force projection platform, enabling the JTF to take the fight to the enemy. The future expeditionary engineer force—it's here, it's now, it works.

Lieutenant Colonel Crall is the Commander of the 27th Engineer Battalion (Combat) (Airborne) at Fort Bragg, North Carolina.

Endnote

[1]Engineer Technical Letter 01-6, *Contingency Airfield Pavement Specifications*, 12 June 2001.