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**Air Force Civil Engineers in Joint Engineer Operations:
Validating the Concept and Incorporating Lessons Learned**

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract

This paper examines the recent assignment of U.S. Air Force civil engineers to joint missions, across the range of military operations, in order to forecast the feasibility and suitability of continuing this practice in the future. Air Force engineers have been extremely effective in joint combat support roles, since their substantial joint combat use beginning in 2004. Based on this success, their demand has grown and will likely grow beyond the current conflicts in Iraq and Afghanistan. Air Force leaders have raised valid concerns with forces organized, trained, and equipped to support combat air power being overused for combat service support of the land component. Joint employment of Air Force engineers to an extent or in a manner that undermines their ability to support bed down and sustainment of air power assets would be problematic. In addition, issues spanning apportionment in global force management processes, roles and missions for Air Force engineers in the joint environment, and command relationships between service engineer units in joint operations should be further studied and where appropriate incorporated in joint engineer doctrine.

INTRODUCTION

The use of U.S. Air Force civil engineers in joint combat support roles has proven to be extremely effective in current operations in both Iraq and Afghanistan, and based upon this success, the demand for joint engineers is growing. With this success, there are a number of lessons that joint engineers have learned regarding the most effective application of this versatile, highly regarded, but small community, and how to do so in an interdependent versus independent but complimentary manner.¹ To that end, the military engineer community must internalize those lessons, incorporating the most critical in joint and service policy and doctrine.

Air Force leaders have raised valid concerns with forces organized, trained, and equipped to support combat air power being overused for combat service support of the land component. Joint employment of Air Force engineers to the extent or in a manner that undermines their support of the bed down and sustainment of air power is problematic. Moreover, issues spanning appropriate command relationships among service engineer units, best-suited roles and missions for Air Force engineers, and Air Force engineer apportionment in global force management processes should be resolved now before perceived service disparities become an impediment to future joint cooperation.

Air Force engineers are actively contributing to the joint fight, both in traditional air power support and non-traditional ground combat support roles; this is significant and important, and it should continue. Such versatility suggests that joint engineer doctrine and operations are evolving—for the betterment of both joint war fighting and the most effective

1. Paparone, “What Is Joint Interdependence Anyway?” 1. “Generals say the future of jointness is interdependence, with no service operating independently and all relying on each other’s capabilities to be successful.”

employment of air power.² Consequently, it is critical that the joint engineer community capture their best practices from recent combat deployments to integrate and employ multi-service engineer capabilities more effectively in optimizing the joint engineer force.

BACKGROUND

Doctrinally, the roles of military engineers span three principal functions—combat engineering, general engineering, and geospatial engineering.³ Combat engineering encompasses those activities that support maneuver of land combat forces by enabling mobility, counter-mobility, and survivability—predominantly the domain of the land-component engineers in the Army and Marine Corps. The second function, general engineering, involves more traditional engineer functions (e.g., horizontal and vertical construction, well-drilling, and installation engineering).⁴ Each of the services maintains capabilities in this functional area, predominantly in horizontal and vertical construction.⁵ In recent decades, however, installation engineering has been more often out-sourced or transferred to the civil service or contractors, as the services have dealt with constrained fiscal and force-level ceilings by streamlining active duty manpower authorizations in

2. JP 3-34, *Joint Engineer Operations*, I-1. “Engineer capabilities are a significant force multiplier in joint operations, facilitating the freedom of action necessary for the joint force commander (JFC) to meet mission objectives. Engineer operations modify, maintain, provide understanding of, and protect the physical environment. In doing so they assure the mobility of friendly forces, alter the mobility of adversaries, enhance the protection and enable the sustainment of friendly forces, contribute to a clear understanding of the physical environment, and provide support to noncombatants, other nations, and civilian authorities and agencies.”

3. JCS, *Joint Engineer Operations*, I-2.

4. While not a formal term found in joint doctrine, for the purposes of this paper, “installation engineering” comprises the following capabilities and activities defined in JP 3-34, *Joint Engineer Operations*: command and control of engineer forces and assets, force bed down, base camp development, site surveys, digitized mapping, real estate management, construction and repair of infrastructure and facilities, infrastructure and facilities operations and maintenance, hardening, environmental management, and protection (fire and emergency services, disaster preparation and consequence management, and explosive hazard disposal).

5. JCS, *Joint Engineer Operations*, Appendix B.

combat service support organizations and moving them to the combat arms branches.⁶

The Air Force has followed suit. However, it has chosen to maintain a corps of active duty engineers (roughly 16,600 airmen) charged with garrison planning, development, and sustainment and organized, trained, and equipped to deploy and accomplish the same tasks at forward locations.⁷ Their core competency is rooted in installation engineering, and they comprise a substantial portion of the active military's tactical-level forces who are expert in this function. To understand why, one must consider the role of the air base in the provision of air power. The air base is the platform from which land-based air power is projected—particularly air power involving long-range bombers, air refueling tankers, and large military transport aircraft. That differs significantly for the Army, Marine Corps, and Navy, who project force with mobile infantry, armor, and helicopters or surface ships and submarines. Army and naval installations, while important to those garrisoned there, are not the platforms from which soldiers, marines, and sailors fight. It makes sense that today the majority of installation engineering functions on Army posts and Marine and Navy bases/stations are performed by government civilians or contractors. To the contrary and similar to how the Navy might regard an aircraft carrier, an air base is a complex system of systems upon which airmen are dependent to fight. Without that system of systems and persons expert in operating it, the Air Force cannot project air power. Therefore, active duty airmen ensure air

6. Portions of the research are based on the personal experiences of the author, a veteran combat engineer and former civil engineer squadron commander having served in U.S. Air Force civil engineer squadrons since 1992, and most recently having commanded units both in combat (Joint Base Balad, June 2006-2007) and garrison (Ellsworth AFB, SD, June 2007-2009).

7. (Hartzer, "Heritage to Horizons," 14-16.) These Air Force engineers trace their lineage to the Army Air Corps aviation engineers—specialized units trained to construct airfield and aircraft support facilities during World War II. As the Air Force matured into a separate service, playing substantial roles in military conflicts from Korea to Iraq, so too has the Air Force engineer corps. From the advent of the Prime Base Engineer Emergency Force (Prime BEEF), mobile engineer teams, designed to operate or recover forward airfields, and the Rapid Engineer Heavy Operational Repair Squadron, Engineer (RED HORSE), heavy repair squadrons, geographically-located for rapid deployment to support the bed down of air power, Air Force engineers have become force multipliers for the joint general engineering function.

power is available from bases both at home and at deployed locations.⁸

AIR FORCE ENGINEERS IN THE JOINT FIGHT

There is little doubt that Air Force engineers should be used for joint combat support missions, to the extent their apportionment, allocation, and assignment to those missions does not undermine the projection of combat air power. Since 2001 the general engineer capability resident in Air Force ranks has become more visible to joint force commanders, and as a result Air Force engineers have deployed more often for substantial employment in the Afghan and Iraqi theaters of operation to roles beyond their traditional ones. Similarly, other Air Force specialties have also been deployed to support combatant commanders in non-traditional roles.

As of August 2007, there were more than 25,000 airmen deployed to operations in support of the war on terrorism. Nearly 6,200 of those airmen were deployed for non-traditional use.⁹ As of October 2009, there are 2,615 Air Force engineers deployed of which more than 1,000 are in non-traditional roles. These numbers are consistent since 2004, when taskings for airmen began to climb. Between 2004 and 2007, the Air Force deployed roughly 22,000 airmen in ground combat missions and those deployments have continued over the

8. Air Force engineers are organized in squadrons, comprised of military personnel (assigned to Prime BEEF teams) and federal civilian employees. These squadrons are responsible for installation construction, maintenance, and repair, as well as operations to include fire protection, explosive ordnance disposal, and emergency preparedness and management. The blend of military and civilian personnel serves a dual purpose. The civilian core remains in garrison during periods of military deployment to sustain flying and base support operations. Equally important, the civilian core assists with the technical development and training of the military engineers, craftsmen, firefighters, and so forth. By working side by side to sustain installations in garrison, this military-civilian team ensures the airmen can do so on their own when called to deploy. This construct has been heavily tested since the first Prime BEEF deployment more than 40 years ago, and it has repeatedly proven effective.

9. Buzanowski, —General Testifies on Air Force in-lieu-of Strategies,” 1.

last two years.¹⁰ This somewhat unanticipated requirement for an already-small engineer contingent has caused concern among Air Force leaders.

First and foremost, the Air Force exists to project combat power across the domains of air, space, and cyberspace. To do this, the Air Force presents forces in task-organized, integrated packages—tailored with the appropriate balance of force, sustainment, control, and force protection.¹¹ To sustain, control, and protect the force, this appropriate balance includes the right mix of operations functions and combat support functions. Combat support and operations together create combat capability.¹² Therefore, to ensure the availability of combat capability, the Air Force must organize, train, and equip combat support forces for its primary mission responsibilities.

Air Force leaders fear that supporting non-Air Force missions for extended periods could have long-term detriment to the Air Force and America's overall security.¹³ These concerns center on the cost to sustain non-air power missions—fiscal costs to train and equip airmen for ground combat missions they would not otherwise conduct, and other longer-term recruiting and retention costs. Operations tempo has put a well-publicized strain on the Army and Marine Corps, and while the Air Force is subject to the same strain, particularly in its low-density, high-demand specialties, Air Force engineers are experiencing similar dwell rates as soldiers and marines.¹⁴ Finally, there is concern that airmen may lose touch with their culture and roles as airmen, the more they are immersed in ground combat support missions. Given these concerns, one can envision how these costs may have the long-term effect of distracting airmen from their primary mission sets and thus undermining the combat

10. Ibid., 1.

11. Department of the Air Force, *Air Force Basic Doctrine*, x.

12. Ibid., 47.

13. Goodfellow, —Ainen as 'Light Infantry' May Hinder Air Force Mission," 2.

14. Robert Cronan, CMSgt, USAF, email to author.

capabilities of the overall force.

What was very clear with the arrival of the nineteenth Chief of Staff of the Air Force, General Norton Schwarz, is that —the Air Force is all in . . . wherever it is, whatever’s needed and whatever it takes.”¹⁵ Shortly after taking the Chief of Staff job, General Schwarz met with his service counterparts to state unequivocally the Air Force’s position to —embrace a collaborative and supportive role in the types of low-level ground wars being fought in Iraq and Afghanistan.”¹⁶ Regarding in-lieu-of taskings, Schwarz’s words were direct, —it’s not in-lieu-of anything. . . . Why do we use a term that is inherently pejorative to describe doing worthwhile wartime work?”¹⁷ This shift in thinking was significant. When viewed from the field, it seemed the Air Force’s position had transitioned from one of wondering when it would be able to extract itself from non-traditional ground combat missions to looking toward sustaining these missions for the foreseeable future, and in turn, actively thinking about how to better prepare airmen for the long term. While it is not clear from Gen Schwarz’s remarks whether he envisions airmen embracing these non-traditional missions as future core mission sets (against which the Air Force would organize, train, and equip) or if they were simply his expression of the Air Force’s contributions to current operations in Iraq and Afghanistan. Regardless, the argument for Air Force engineers being —all in” for the long-term is rooted in joint engineer doctrine and examples of joint engineer operations from

15. Malenic, —Air Force Chief Signals Major Cultural Shift within the Service,” 1.

16. Ibid.

17. Ibid.; The use of airmen in roles outside of their traditional service functions is a relatively new phenomenon—seen recently in substantial and growing numbers. This construct (formerly called —in-lieu-of” tasking) has been coined by the Air Force —Joint Expeditionary Tasking” by Gen Schwarz and has been a source of public contention among senior Air Force leaders. Some have suggested that the service has become a de-facto combat support/combat service support arm for the Army. In spite of this, it is hard to envision service leadership (if they were so inclined) saying, —We’re not doing this anymore.” Therefore, for the sake of contingency and crisis-action planning, optimal organizing, training, and equipping, and ultimately/most-importantly the airmen who will deploy for these missions, the Air Force needs to come to terms with the planned future use of this construct.

the last three decades.

From a doctrinal perspective, the “interdependent engineer” concept is already being formalized.

Each Service has core engineering units and capabilities that stem from their traditional roles and associations to meet specific operational needs and to support accomplishing a variety of mission requirements in any environment. An understanding of the Services’ combat, general, and geospatial engineering capabilities allows the JFC and the joint force engineer to tailor the engineer force to effectively and efficiently accomplish the mission.¹⁸

Further, through the efforts of the Joint Operational Engineering Board (JOEB), the services are partnering to move the military engineer branches to a more interdependent position. The JOEB, co-chaired by the JCS/DJ4 and the Engineer Capabilities Area Manager at OSD, is comprised of five working groups designed to integrate and manage the DoD’s military engineer capability portfolio more effectively. The JOEB working groups target transformation, capabilities, doctrine and training, interoperability, and sourcing in the joint engineer environment.¹⁹ If effective, the framework for optimizing the use of joint engineer capabilities already exists.

From a historical perspective, Air Force engineers have already established a precedent for supporting the joint fight. Over the last three decades and outside of traditional aviation/air power engineer support missions, Air Force engineers have been engaged supporting sister-service and joint operations. Air Force engineers supported force bed down and installation engineering missions for Army helicopter units in Bosnia, have been consistently engaged (building schools, clinics, and other civil works) as part of theater

18. JCS, “Joint Engineer Operations,” I-6.

19. SAME, “Joint Operational Engineering Board: Making a Difference for Joint Operations,” Chart 8.

security cooperation in South America and the South Pacific.²⁰ More recently, Air Force engineers supported NORTHCOM homeland defense missions along the U.S. southern border and consequence management missions elsewhere in CONUS.²¹ Air Force engineers have also served on stability operations missions while integrated with Army engineer elements, training Iraqi civilians in engineer vocational skills.²²

With guidance already in joint engineer doctrine and the focus of the JOEB, both framed by a demonstrated history of valuable Air Force engineer contribution to joint force commanders, there is good reason to plan for continued substantial use and sustained concept maturation. Senior Air Force engineer leadership and engineer officers on joint combatant commander staffs will need to remain vigilant to ensure Air Force engineers are not overextended to the point that their core mission sets suffer. If the projection of combat power in air, space, and cyberspace were compromised by a lack of available combat support capability or capacity, the benefits will not have outweighed the costs. Given what has been observed to date, however, the results are very promising.

There are still a number of challenging lessons involving the more effective integration of Air Force engineers into the joint fight that are being and still need to be addressed, such as improving the apportionment and allocation process. If they are more visible to joint planning groups, Air Force engineer units can be assigned the mission sets that are best matched to their specific core competencies. There has been substantial debate in recent years about the proper command relationships among service engineer forces in the

20. Hartzer, "Heritage to Horizons: Commemorating 60 Years of Air Force Civil Engineer History," 23; Brown, "The Role of Air Force Civil Engineers in Counterinsurgency Operations," 45; Bulson, "Island Engineering," 27.

21. Ostrich, "RED HORSE Makes Difference on Border," 1; Michael Myers, Lt Col, USAF, email message to author, 14 October 2009.

22. Stadel, "Village of Hope Gives Iraqis New Perspective," 1.

joint operating area. Those relationships need to be further evaluated and formalized.

Inherent with those command relationships are the service challenges of resourcing engineer units in the joint environment.

LEVERAGING AND OPTIMIZING AIR FORCE ENGINEERS

‘Seeing’ the Total Engineer Force

In the unclassified “General Purpose Forces – Air Force” apportionment table in the GFMIG, only the RED HORSE component of the Air Force engineer corps is apportioned for purposes of contingency and crisis-action planning.²³ The Prime BEEF component, which comprises more than 80 percent of the active Air Force engineer corps, is not called out separately in the table.²⁴ This is due to the manner in which the Air Force has traditionally presented forces. Just as Prime BEEF units are not called out for apportionment, neither are the other combat support forces (e.g., maintainers, communicators, logisticians, etc.) As noted above, the Air Force arranges forces in the form of task-organized, integrated packages (i.e., in support of specific fighter or bomber aircraft). Those packages require both the operational functions and associated combat support functions in order to produce operational combat capability. Thus, both functions are linked and incorporated into the GFMIG by aircraft package.²⁵

While Air Force engineers have been involved in joint operations and theater engagement activities for many years, their involvement has resulted from functional interaction between combatant commander and service staffs rather than because of specific

23. OSD, *GFMIG (Secret)*, Table IV-7 (U).

24. AFA, “The Air Force in Facts and Figures,” 38.

25. Ben Wham, Col, USAF (former AFFOR/A7, USCENTCOM, Jun 08-Jun 09), interview by the author, 16 October 2009.

planning activities—of either a contingency or crisis-action nature.²⁶ Further, the significant increase in Air Force engineer joint involvement since 2004 began with a trickle and rapidly grew to today's levels through repeated requests for forces from the JFC. As the Army wrestled with a spike in its overseas operations and personnel tempo and a severe shortage of combat support and combat service support forces, it started to lean more heavily on the Air Force. In hindsight, one could argue that Air Force engineers were rolled into joint missions more often as an afterthought than because of deliberate planning. That is changing, as JFC staffs are requesting Air Force engineers earlier in their planning stages, when missions can be assigned to various service engineers where they best match capabilities, as opposed to where there are no viable alternatives.²⁷

The Air Force needs to tailor its approach to force presentation as well, or at least modify the way it allocates Prime BEEF units. The precedent has already been set for Air Force security forces by the Global Force Management Board (GFMB). Security Forces are incorporated as part of aircraft force capability packages in the GFMIG, though are identified separately by the GFMB to make them more visible for joint planning groups.²⁸ The Air Force should pursue such an approach for Prime BEEF units as well, to enable better engineer support to the joint fight. In doing so, however, it will be extremely important for airmen assigned to joint staffs to have an input into the proper, most appropriate assignment of Air Force engineers, while ensuring they are made available for the projection of combat air power when and where it is needed.

26. Philip Hicks, Lt Col, USAF, Joint Engineer Plans/Contingency Officer, USJFCOM/J4, interview by the author, 21 October 2009.

27. Craig Johnson, Lt Col, USAF (former USFOR-A J7 plans officer), interview by the author, 16 October 2009.

28. Ben Wham, Col, USAF, interview by the author, 16 October 2009.

Where Do Air Force Civil Engineers Best Fit in the Joint Environment?

Air Force engineers are best organized and tasked to support the projection of air power, and should first be assigned those general engineering missions supporting the opening, construction, and operation of airfields. The use of the term “air power” in this context should not be limited to only include Air Force air power. In his 2001 paper on the concerted operations of Army Apache helicopters and Air Force fighter aircraft, Col (US Army) Brad Mason describes the feasibility of combining these weapons systems at forward bases to streamline logistics support.²⁹ Today, at Joint Base Balad north of Baghdad, Army fixed- and rotary-wing aircraft have been operating alongside Air Force fixed-wing (fighter, airlift, and unmanned) aircraft and a combined, joint special operations air component for more than four years. What began as an Army-only, rotary-wing aviation operation, supported by Army aviation support units, has grown and evolved into a joint air power operation involving more than 200 aircraft at an installation sustained by Air Force-integrated base operating support (BOS-I). Air Force engineers stationed at Balad coordinate all (and provide the majority of) general engineering support for all air power units operating from that location. In addition, Army and Navy units operating from the Logistics Support Area on Balad rely on the Air Force engineers to integrate their base operating support. This transition (from Army to Air Force BOS-I) occurred in 2008 and was significant because it relieved Army units for under-sourced combat support and combat service support missions elsewhere in the operating area.

Joint Base Balad, while an example of how Airmen may be best employed, also highlights gaps in joint engineer doctrinal shortfalls regarding the opening and development of expeditionary airfields. Due to the nature of the Air Force engineer garrison organization

29. Mason, “U.S. Army Apache Helicopters and U.S. Air Force Expeditionary Forces,” 10.

and mission (operation and sustainment of airfields day in and day out), one can argue that had Air Force engineers been involved with airfield planning and construction at Balad when the original aviation units were sent in, some of the challenges still present today could have been avoided or mitigated. Balad has problems with explosive safety incongruities, because much of the LSA encroaches on the airfield. Millions of dollars of billeting and supply facilities were constructed well within explosive clear zones associated with fighter aircraft shelters. Military engineers should expand joint engineer doctrine and training to include these types of installation development and planning lessons to avoid similar problems in the future.³⁰

In contrast, Tallil AB near An Nasiriyah, Iraq, is an example of the successful bed down and integration of combat air power through early use of Air Force engineers in the bed down process. On 22 March 2003, the 1st Brigade Combat Team of the 3^d Infantry Division seized the Tallil airfield on their initial push toward Baghdad. Air Force special tactics and combat support units were brought in within days and, along with Army combat engineers, recovered the airfield for A-10 operations within one week of initial seizure. There were many reasons why this was so successful, but a recurring theme was the joint involvement of both airmen and soldiers in the early planning phases for airfield operations.³¹

Beyond airfields, Air Force general engineering competencies related to the planning, design, construction, and operations of expedient installations makes them an excellent fit for the provision of installation engineering support to the land component. This was recently validated in Afghanistan when Air Force civil engineer officers were brought to theater in October 2008 to serve on the planning teams for the deployment of additional brigade

30. The author commanded 332 ECES from June 2006 – June 2007 and helped prepare the initial proposal for the transition of the BOS-I responsibilities from the Army to the Air Force.

31. McCallie, —“Civil Engineer’s Perspective,” 17-18.

combat teams in the spring of 2009.³² The use of Air Force engineers in this general engineering role frees Army engineer units for those combat engineer missions necessary for direct support of maneuver units. Put simply—Air Force engineers are better equipped for general engineering installation construction and sustainment roles, while Army combat engineer units are better suited for direct support of ground combat units. Joint planners should consider this when considering their employment.

Air Force engineers also can be force multipliers for consequence management and disaster response missions. They provide this function every day for Air Force bases in garrison. From emergency preparedness to fire protection and explosive ordnance disposal, to recovery operations with engineer forces, Air Force engineers can bring value to JFCs tasked with these mission sets. In 2007 Air Force engineers at Holloman AFB, NM, were assigned to USNORTHCOM. Their mission was to fold into an Army Engineer Brigade to support consequence management and disaster recovery operations as necessary for homeland defense.³³

Prime BEEF units, designed for the air power combat support mission and to work in concert with the other elements of Air Force combat support (i.e., communications, vehicle maintenance, and supply) do not have those core support functions indigenous to their ranks. When in garrison or deployed in their traditional roles, those functions are provided by communications and logistics support squadrons, respectively. This shortfall presents a challenge for joint planners seeking to task Prime BEEF units assumed to be self-sustaining (as are Army engineer units).³⁴ This issue is connected to the larger issue of command relationships in the joint engineer environment and is a third area that needs to be resolved to

32. Craig Johnson, Lt Col, USAF, former USFOR-A engineer staff officer, email to author, 26 September 2009.

33. Michael Myers, Lt Col, USAF, former 49 CES/CC (Holloman AFB), email to the author, 13 October 2009.

34. Ibid.

optimize the use of Air Force engineers in the joint fight.

Command Relationships in Joint Engineer Operations

The issue of command relationships between Service engineer units is one of the most substantive for those coordinating joint engineer operations. It has been a source of debate between Army and Air Force engineer leaders in recent years—particularly as Air Force engineers work in Iraq and Afghanistan in direct support of land component forces. Joint engineer doctrine describes two command relationship structures—operational control assigned to the service component (called Service Component Command) and operational control assigned to the functional component (called Functional Component Command). Joint doctrine emphasizes that command relationships should be simple and easily clarified in order to be effective and suggests that most often joint forces are organized in a combination of Service and Functional Component Commands.³⁵

In Iraq, OPCON of Air Force engineers deployed to support air power missions was assigned through the Air Force chain of command, to the COMAFFOR, consistent with Service Component Command.³⁶ TACON of those Air Force engineers was assigned to the Army engineer brigade who established direct support relationships with the maneuver units. This was a source of contention for both services. The Army wanted both OPCON and TACON, arguing that it better supported the unity of effort for all engineers operating in support of the ground component. The Air Force wanted both OPCON and TACON of all Air Force engineers assigned to the theater. The Air Force argued that it could not only effectively employ all Air Force engineers in direct support of ground commanders, but by

35. JCS, *Joint Engineer Operations*, II-3 – II-5.

36. *Ibid.*, II-4.

leveraging the capabilities of other Air Force combat support functions already deployed to theater, could provide effective support more efficiently.³⁷

The Air Force successfully made its case to USFOR-A in 2008. Assigned ADCON, OPCON, and TACON of Air Force engineers, the COMAFFOR established a Prime BEEF Group, headquartered at Bagram AB, comprised of two squadrons geographically aligned to operate at multiple forward operating bases in the Northeast and Southwest. The group commander (O-6) reported directly to COMAFFOR but had a direct support relationship with the Army Engineer Brigade commander (O-7) working for the CFLCC. The two squadrons have established further direct relationships with supported ground maneuver units in their operating areas. To date, this construct has been well received, though it is admittedly in its infancy.³⁸

While the above construct appears to depart with doctrine because it does not fit cleanly into either the Service or Functional Component model, JP 3-34 is clear that flexibility is the key to finding the command relationships that best serve the joint fight.

Engineering forces are extremely adaptable and can be tailored to any joint force organizational structure. In addition, the structure that is developed needs to be flexible enough to change as the situation warrants. Transitions between offensive, defensive, and stability operations will have a significant effect on the frequency and type of missions performed and therefore the type of engineer support required. The different authority and control options [presented in this chapter] are designed to take advantage of this flexibility. *Most often, joint forces are organized with a combination of Service and functional component commands* [emphasis added].³⁹

The real measure of this construct will be the reports of the supported ground commanders.

37. Ben Wham, Col, USAF, interview by the author, 16 October 2009.

38. Yolitz, "US Air Force Central Update for ACC Civil Engineer Commanders and Chiefs."

39. JCS, *Joint Engineer Operations*, II-3.

If not satisfied with the direct support provided to them by the Prime BEEF Group, one would expect to see additional requests for engineer forces that would likely be employed with OPCON and TACON applied differently. In the end, this debate centers on improving efficiency while maintaining effectiveness. The Air Force has proposed an organization and command relationship that it believes will do that. Each additional general (installation) engineer unit in theater represents one less maneuver unit available for primary mission objectives; so, both effectiveness and efficiency are important when it comes to installation engineering.

There is the related challenge of resourcing Air Force engineers operating within this command relationship. As discussed above, in their traditional roles Prime BEEF units do not have indigenous communications, transportation, and supply capabilities. Per doctrine, the ADCON unit retains these responsibilities. That has not happened, and Air Force engineers have had to rely on Army communications and logistics functions for support at the forward operating locations to which they are assigned. In addition to sourcing logistics support in theater, sourcing for pre-deployment training and equipping is also a question. Air Force units performing missions that expose them to ground combat threats have relied on Army force projection platforms for pre-deployment specialized training that they have not otherwise had in the past.⁴⁰ As Air Force engineers continue to mature their capacity for employment in the joint environment, they will need to adapt and grow current training and equipping capacity.⁴¹ It seems logical to leverage joint training and equipping processes

40. When assigned ground combat support missions, Air Force engineers typically travel between forward operating bases by ground, exposing to ground combat threats. They are also performing general engineering tasks outside of the controlled installation perimeters. This requires combat training skill sets and equipment not traditionally required for Air Force engineers operating within the installation perimeter.

41. Ben Wham, Col, USAF. Email to author, forwarding a draft compilation of lessons learned (prepared by Michael Francis, Capt, USAF) relating to the stand-up of EPBG-Afghanistan, 16 October 2009.

where the training and equipment is the same or similar regardless of engineer service component. However, the Air Force will also need invest to robust its engineer logistics capability. A long-term solution to this problem likely involves an Air Force re-look at how Prime BEEF forces are organized in garrison. Further exploration of this idea is beyond the scope of this paper.

CONCLUSION

—Engineer capabilities are a significant force multiplier in joint operations, facilitating the freedom of action necessary for the joint force commander to meet mission objectives.”⁴² Air Force engineers should be used for joint combat support missions, to the extent their apportionment, allocation, and assignment to those missions does not undermine the projection of combat air power. This has proven true in current joint operations in Iraq and Afghanistan, as well as in recent decades while supporting other major military operations and theater engagement strategies. Air Force engineers are actively contributing to the joint fight, both in traditional air power support and non-traditional ground combat support roles; this is significant and important, and it should continue.

Despite their success, there are a number of lessons joint engineers have learned, regarding the most effective application of these relatively low-density and high-demand assets. The military engineer community must revisit lessons learned, incorporating key points in joint and service policy and doctrine.

Air Force leaders have raised valid concern over the use of forces organized, trained, and equipped for the provision of combat air power support in combat service support roles for the land component. Joint employment of Air Force engineers to an extent or in a manner

42. JCS, *Joint Engineer Operations*, I-1.

that would undermine their employment in support of the bed down and sustainment of air power assets would be problematic. The global force management process should be modified to provide more complete visibility of all joint engineer capabilities, and the Air Force should contribute to this effort by tailoring its approach to force presentation where engineers are concerned. At the same time, the global force management process should be adjusted to ensure assignment of Air Force engineers does not degrade the Air Force's ability to project air power. Joint planners need to be very deliberate when assigning engineer missions to service engineer components. First among assignments for Air Force engineers should be installation engineering at joint airfields. This is the primary competency for Air Force engineers and the most effective and efficient manner of their employment. Finally, the issue of command relationships needs continued examination. The new Prime BEEF Group construct recently established in Afghanistan should be studied and, if effective and efficient, incorporated in joint engineer doctrine.

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