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15.Abstract:

To fully optimize his limited engineering resources and better direct them to his critical needs, the Joint Force Commander (JFC) needs direct access to a single point of contact for engineering operations to better coordinate and integrate all engineer forces throughout military operations. Experience shows that both repositioning his engineer from under the J4 into a separate staff element, and then establishing an engineer functional component command or subordinate Joint Task Force (JTF) ensures more efficient and effective engineering support during joint operations.

While joint doctrine allows the JFC latitude in placing engineer leadership within the JTF, most often tradition is followed and a small engineer staff is placed under the J4. Furthermore, in recent operations, unity of effort (necessitated by poor unity of command) appears to be lacking for engineering work. While all of the Services have engineer capabilities and joint doctrine discusses a “Joint Engineer”, we have not yet organized to maximize engineering efforts during joint operations.

In this paper, my goal is to briefly explain current Service-engineer capabilities, describe the command and control (C2) organizations of engineers in recent operations and evaluate their success, illustrate four potential courses of action (including the status quo) and prove why combining two of the options is the best alternative.

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NAVAL WAR COLLEGE

Newport, R.I.

MILITARY ENGINEERS WITH UNITY OF COMMAND: WHY IS THIS SO HARD?

by

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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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MILITARY ENGINEERS WITH UNITY OF COMMAND:

WHY IS THIS SO HARD?

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”Every time I pass a bulldozer, I want to stop and kiss it.”

- W.F. Halsey: On Guam, 1945

To maintain peace and stability, it is imperative that we do our utmost to restore order and control to regions of the world that we rid of terrorists. Engineers have the ability to reconstruct, train, and nurture nations ravaged by combat. By improving the standard of living for non-combatants in these third-world countries, engineer forces validate the war is indeed against terrorism, not religion, and further legitimize our cause within the international community.

Through infrastructure repair, engineers contribute in forming permanent links to those nations or regions important to our security interests. “Our experience in the United States, backed by findings of recent national and Congressional commissions, is that public works development can be one of the major means to build democratic institutions and a market economy.”[1] In contrast, the absence of engineers “becomes a major source of popular discontent, a breeding ground for disaffection and violence [in third-world countries].”[2]

The thesis of this paper is that in order to fully optimize his limited engineering resources and better direct them to his critical needs, the Joint Force Commander (JFC) needs direct access to a *single point of contact for engineering operations* to better coordinate and integrate all engineer forces throughout military operations. Experience shows that both repositioning his engineer from under the J4 into a separate staff element, and then establishing an engineer functional component command or subordinate Joint Task Force (JTF) ensures more efficient and effective engineering support during joint operations.

While joint doctrine allows the JFC latitude in placing engineer leadership within the JTF, most often tradition is followed and a small engineer staff is placed under the J4. Furthermore, in recent operations, unity of effort (necessitated by poor unity of command) appears to be lacking for engineering work. While all of the Services have engineer capabilities and joint doctrine discusses a "Joint Engineer", we have not yet organized to maximize engineering efforts during joint operations.

Moreover, Joint Pub 4-04, Joint Doctrine for Civil Engineering Support, states, "The implementation and execution of civil engineering functions remain the responsibility of the Service and the Service component commanders."[3] Meanwhile, Joint Pub 3-34, Engineer Doctrine for Joint Operations, states, "Ensure unity of command under one responsible commander for every objective."[4] This is troublesome, as it has become the responsibility of the engineers of the various Services on the ground to work out arrangements and cooperative support. Each Service brings their own engineers into theater and cross support only results out of necessity through ad-hoc relationships.

Furthermore, in sizing engineer forces, the JFC must ensure that all of the "shared assets" such as main supply routes (MSRs), airfields, and utilities distribution systems are allocated to specific Services. Many times, the Services assume someone else is responsible for the community property.

In this paper, my goal is to briefly explain current Service-engineer capabilities, describe the command and control (C^2) organizations of engineers in recent operations and evaluate their success, illustrate four potential courses of action (including the status quo) and prove why combining two of the options is the best alternative.

CURRENT CAPABILITIES

Without going into too much detail on every capability of each Service's engineer force, it suffices to say that all Services have engineers and their capabilities are strikingly similar. Some do combat (mobility, countermobility, and survivability) engineering, some do general (sustainment, support) engineering, and some do both.

Army engineers are capable of both combat and general engineering missions, as well as topographic engineering. They construct and maintain facilities including airfields and ports, open lines of communications (LOCs) and MSRs, drill water wells, conduct quarry operations, provide electrical power, install assault float (ribbon) bridging, and, unlike the other Services, provide terrain analysis products. They support Army forces in theater.

Navy SEABEEs, or Construction Battalions, have general capabilities similar to Army engineers, but are not trained in combat or topographic engineering. Skilled in follow-on bridging, they are also proficient in underwater construction, fleet hospital establishment, and support to joint logistics over-the-shore (JLOTS), including elevated causeway systems (ELCAS) and fuel delivery. They support Navy and Marine forces during both amphibious operations and once in country.

The Air Force’s Rapid, Engineer-Deployable, Heavy, Operational, Repair Squadron (RED HORSE) are similar to SEABEEs, but support Air Force personnel primarily at theater airfields. They provide support systems including emergency airfield lighting and arresting gear, explosive ordnance disposal, and aircraft fire, crash, and rescue. The Air Force also has Prime Base Engineer Emergency Forces (Prime BEEF) who construct rapid bed-down facilities and provide rapid runway repair (RRR) and maintenance.

USMC engineers are primarily concerned with combat engineering, specializing in amphibious operations, but are also skilled in bridging and installing fuel storage and distribution systems. Navy SEABEEs augment Marine engineers by providing complementary general engineer forces to the Marine Air-Ground Task Force (MAGTF).

The Army, Air Force, and Navy also have construction contracting capabilities to augment their military engineers with civilian personnel. Again, the Army's Logistics Civilian Augmentation Program (LOGCAP), the Navy's Construction Capabilities Contract (CONCAP), and the Air Force's Contract Augmentation Program (AFCAP) are extremely similar in their support and flexibility to the JFC. The Army and Navy also have real estate specialists for purchasing or leasing facilities and land, as well as environmental engineers.

With such similarities, a single command and control element for engineers during joint operations seems intuitive.

OPERATIONS IN THE RECENT PAST

Throughout the range of military operations, engineers are playing a larger role and must be able to plug into any task force and combine efforts with other Services or nations to maximize the effect they bring to the JTF. But ironically, there is currently no such thing as joint engineer operations, only engineers in joint operations. In addition, with very few exceptions, the lead engineer for each Service retains operational command (OPCON) of his Service's engineers. The following are examples of recent operations illustrating the strengths and weaknesses of various engineer command and control structures.

The Gulf War

For Operation DESERT SHIELD, each Service provided engineering support for its own forces. Three months into the Operation, after command and control concerns were discovered, the JFC installed the 416th Engineer Command to provide overall management and execution tasking for all engineers in theater. At that point, each Service's engineers were more effectively leveraged to provide maximum support to the combined Operation.

Following the Gulf War in March 1991, during Operation PROVIDE COMFORT, the logistics division (C4) of the combined staff did have a Staff Engineer, but he had no directive authority. Instead, the JFC gave the Commander of the 20th Engineer Brigade OPCON of all engineer units in theater to include Army engineers, Navy SEABEEs, RED HORSE forces, and engineers from other NATO countries. The Commander, as the JTF Engineer, then established a separate engineer component with liaisons in the J3, J4, and J5 staffs.[5] The JTF Engineer had direct access to the JFC, clearly understood his intent and critical needs, and could therefore prioritize the engineer effort to meet mission requirements. By using the strengths of all the service engineers, this "joint engineer group" designed camp layouts, built road systems, erected tents, and installed lighting and fencing. They also constructed hospital administration areas, playgrounds and storage facilities for nongovernmental organizations (NGOs). This single command and control element in the field was crucial in prioritizing missions and properly allocating the scarce engineer resources to ensure mission accomplishment.[6]

Somalia

In 1993, during Operation RESTORE HOPE, the JTF Engineer and his staff were again placed under the control of the J4. Because of command and control challenges, the after

action report recommended that for large operations a JTF Engineer should be a special staff element and that for smaller operations the engineers should be placed under the J3 vice the J4.[7]

During the follow-on mission, Operation CONTINUE HOPE, engineer planning and command and control was fragmented. The U.N. and JTF had separate engineer staff elements, so there was no single person to coordinate the total engineer effort. "Out of frustration and desire to simplify work, weekly meetings were held with all in-country key engineers. As a result, communications flowed [more smoothly], actions were expedited, and efficiency of work improved."[8] Because of these meetings, Naval Mobile Construction Battalion (NMCB) FORTY, in country to support USMC forces, was leveraged to support the other Services and several coalition nations.

Haiti

To support the U.S. mission for UPHOLD DEMOCRACY in 1994, an Air Force officer led the joint engineer staff subordinated under the J3.[9] In the initial deployment, the 41st Engineer Battalion staff became the Joint Task Force engineer staff, with augmentation from the Navy for real estate acquisition, as well as the Air Force. By doing this, an organic engineer C^2 organization was directly transferred to the JTF to oversee engineer operations. Upon arrival of the 20th Engineer Brigade, Joint Task Force Castle was formed, which assumed the command and control mission for all engineer assets in theater. With a single C^2 element for engineers, Navy SEABEEs and Army engineers were jointly tasked to construct a bypass road in Haiti. "On staff relationships and C^2, the consensus was the JTF should have an independent engineer staff officer reporting directly to the Commander and

an independent command with all engineer organizations directly under the JFC, to be most responsive."[10]

In December 1994, the Center for Army Lessons Learned (CALL) published Operation UPHOLD DEMOCRACY Initial Impressions in which they strongly applauded the use of a consolidated engineer command at the JTF level, as well as the establishment of an engineer staff section separate and distinct from the J4.[11]

Kosovo

In 1998 and 1999, during Operation NOBLE ANVIL, the engineer-planning cell consisted of an ad-hoc group of active and reserve engineers from the Army, Navy, and Air Force, but the lack of a theater-wide joint/combined engineer headquarters within the Unified Command or JTF resulted in the duplication of C^2 and contract effort, and competition for scarce resources. "In the Balkans' theater of operations, three Services were managing engineer operations using three separate contractors."[12]

Ultimately established, "a brigade-level command and control headquarters was essential to effectively integrate the enormous engineer effort required to get soldiers under cover before winter."[13]

Learning from our past

Operations in the Persian Gulf, Somalia, Haiti, and Kosovo proved the ineffectiveness of J4 staff cognizance over engineers and the benefits of a separate engineer staff element. As far back as 1995, the joint Contingency Engineering Management Group, formed to study the possibilities of integrating engineer forces from different Services, stated that "in light of recent experience, it is clear that potential exists to leverage [engineer] capabilities more

effectively"[14], but entering 2002, we are still no closer to establishing a better organization to accomplish it.

Lessons learned from these operations lead to the conclusion that "creating a separate engineer staff and, for engineer intensive operations, placing the engineers under an engineer headquarters reporting directly to the JFC are best for responsive engineer support to the Joint Task Force."[15]

POTENTIAL COURSES OF ACTION

Joint doctrine allows the JFC options of placing the engineer cell under the J4, J3, or creating a separate staff element. It also permits task-organizing engineers under functional components, Service components, or as a subordinate joint engineer force.[16] While the circumstances of the military operation may dictate a need to subordinate engineers under the J4, the JFC should be wary of using this organization as the norm. In determining the best possible position for engineers in a Joint Task Force, one must look at both the benefits and disadvantages of each alternative.

Option 1: Engineers under J4 (status quo)

While placing the engineer cell under the J4 may be adequate when the engineering mission is purely a logistical one, it creates confusion for those primarily concerned with combat or mobility engineering. In many instances, the engineer is an operational force, not a logistical one. "While engineers and logisticians share numerous interests, the tendency to regard their interests as so nearly congruent as to combine their command and control structures [works] to the pronounced detriment of the theater commander's ability to execute his campaign plan."[17]

Perhaps the most significant impediment to full and effective use of engineer forces in any contingency arises from the traditional view that, aside from the most basic combat-related tasks, engineering is predominantly a logistical function that is primarily concerned with the construction of facilities in support of the sustainment effort. When placed under the J4, the engineer's visibility in operational planning and decision-making is significantly curtailed; interaction with and advice to other staff functions is unnecessarily limited; and independence and the ability to exercise initiative are diminished. Additionally, JFCs often fail to recognize or fully capitalize on the advantage of a total engineer effort that is integrated as an essential part of their operational scheme of maneuver. [18] In most Joint operations, engineer C^2 must reach a balance between combat and deliberate engineering.

Finally, with the speed now needed to move into a theater and the shear magnitude of the logistics tail required, the J4 is already overloaded without having to worry about engineer operations.

Option 2: Engineers under J3

Placing the JTF Engineer within the Operations staff element keeps engineers fully engaged within the operational planning loop. While certainly concerned with logistics, the J3's emphasis is on the battlefield.

While just a participant when subordinated under the J4, the engineer would now become a personal asset to the J3 in the Joint Target Coordination Board (JTCB) by advising his boss of potential issues concerning effects of a downed bridge or damaging MSRs for future operations. Additionally, the engineer currently plays a huge role within the J3-sponsored Civil-Military Operations Center (CMOC) through road improvement, bridging, infrastructure repair, utilities, and mine clearing in support of NGOs and private volunteer

organizations (PVOs). Furthermore, engineer-intensive land deconfliction at the beginning of any operation is also a J3 function.

"In a JTF, the responsibility for combat engineering and civil engineering must be integrated and elevated to JTF staff level through a JTF engineer section subordinate to either the J3 [for smaller operations] or the joint staff director."[19] While placing the engineer under the J3 may be acceptable for small operations, the same concerns of minimizing J3 priorities when under the J4 work in reverse. Although not deliberately, the J4's logistic mission may suffer.

Option 3: J9 - A Separate Engineer Directorate

A Joint Engineer, or J9, having direct access to the JFC would better understand the commander's intent and could, therefore, be more responsive to his critical needs. With a personal "feel" for what the JFC wants, the J9 could clearly articulate each supportable engineering option and its associated benefits and shortfalls.

This type of separated staff position for engineers is already working at both CINCPACFLT and CINCLANTFLT where they have an engineer, usually a Navy admiral, as a separate staff element. At USSOUTHCOM, a separate special staff section for engineers not contained under their J4 was formed. Additionally, Joint Forces Command finds engineering important enough to have renamed their J4 section the "Logistics and Engineering Directorate."

Granted, some will argue that engineers are just looking to accumulate more influence within the JTF, but where staff functions affect numerous other staff codes, separate elements, such as Training or Experimentation, have been formed, and engineers certainly affect a myriad of operations from the J2 through the J5. For the J2, engineers provide

terrain analysis, underwater and site surveys, mineral location, and geodetic survey control for precise positioning. For the J3, engineers enable mobility, countermobility and survivability through mines/countermines, assault bridging, barriers/obstacles, and bunkers/force protection. For the J4, engineers develop bases, repair infrastructure, manage real estate, and ensure LOCs and MSRs are open for movement and resupply. For the J5, engineers establish the civil engineer support plan, ensure required infrastructure is created to support future joint operations, and provide branches and sequels for potential engineering operations. Finally, the Joint Engineer could deal directly with the Joint Rear Area Coordinator (under the J3) for issues dealing with ports, harbors, airfields, and base camps. As a separate staff element with liaisons in each of these sections, the Joint Engineer would be able to objectively support all staff elements in accordance with the commander's intent. The Army, in fact, establishes Corps-level engineers as a separate special staff element because they coordinate all types of engineering tasks with support to the maneuver commander as their first priority.[20] Without equal footing with the other staff codes, the Joint Engineer has a difficult job prioritizing engineering work across the Task Force.

Moreover, there are currently three separate engineer-intensive boards established during joint operations. The Joint Facilities Utilization Board (JFUB), chaired by the JFC or J4, manages facility requirements in theater including real estate issues. The Joint Civil-Military Engineering Board (JCMEB) supports the JFUB by providing policies, procedures, and oversight for all construction and engineer requirements. Finally, the Joint Environmental Management Board (JEMB) establishes policies and direction for environmental issues. While each board's membership is slightly different, many of the same people attend all of the boards. With a separate staff element for engineers, these boards could be consolidated

into one major engineer board chaired by the J9 which would reduce workload for the J4 while eliminating two extra meetings for most of the other participants.

Finally, the JFC's Engineer could stay in country after war termination without an unnecessary command and control shift as "engineer operations facilitate the transition to posthostilities operations."[21] With wash racks, staging areas, custom inspection points, and port clearance, engineers are among the last to leave.

While a separate engineering staff element is necessary during contingencies, it does not need to be permanent in peacetime. The current CINC's engineer (J44) with a minimal staff is sufficient under the J4 in peacetime since the focus is on deliberate planning. But as part of a JTF, engineers should be separated out due to the dramatic increase in combat and topographic engineering missions. With a J9 overseeing engineer operations from crisis action planning to real estate acquisition to joint reception, staging, onward movement, and integration (JRSOI) to war termination, the JFC will fully optimize his engineer capabilities.

Option 4: Joint Force Engineer Component Command (JFECC)

Inevitably, engineers have a shortage of resources and an overabundance of missions; requirements usually exceed capabilities. Also, as operations evolve, priorities change and engineers must have the command structure to be able to react to these adjustments in priority regardless in which Service they reside.

Since "functional component commands can be appropriate when forces from two or more Military Departments must operate in the same dimension or medium or there is a need to accomplish a distinct aspect of the assigned mission,"[22] it makes sense to place a subordinate engineer component command, or a subordinate engineer JTF, directly under the JFC, similar to the Joint Force Air Component Command (JFACC), to direct combat,

general, and topographic engineering, real estate, environmental protection, and construction contracting. As in World War II, when both Army and Navy engineers were consolidated under Commander Construction Troops, a single commander should be responsible to prioritize missions and disseminate execution tasking to all engineer units.

The JFECC would reinforce a theater-wide construction standard, which is critical when dealing with troop bed-down and other quality of life issues. They would control all construction contracting in theater so that the individual Services are not competing against each other for the same services and supplies, and could track all Class IV (construction) material and Class V scatterable mines so as to maximize their use and prevent stockpiling by the Service components.

Working in engineer JTFs or subordinate component commands would induce the Services to allocate more resources to ensure their engineers and equipment are "joint-compatible." In the long run, with similar training and equipment, the Department of Defense would be able to save both time and money through economy of scale.

Under current structures, both the U.S. Army Corps of Engineers (USACE) and the Navy Facilities Engineering Command (NAVFAC) have C^2 capabilities to lead a subordinate engineer JTF. Army divisional engineer brigades and Naval Construction Force (NCF) Regiments can, when augmented with key personnel from USACE or NAVFAC, provide effective and responsive engineer command and control for JFCs. After Hurricane Mitch, for instance, a NCF Regiment provided command and control for the entire engineer effort.

Again, critics will say that an additional component command is an attempt by engineers to create their own "dynasty" within the JTF. In reality, the JFECC would work just like a Naval Construction Regiment within a MAGTF organization, supporting each combat arm

through efficient and effective projects to support mission accomplishment and commander's intent, while remaining a separate and distinct element.

With a subordinate engineer component command or subordinate engineer JTF, the goal of unity of command with centralized direction and decentralized execution can be fully attained.

THE BEST ALTERNATIVE

While certainly a major paradigm shift, we must strive for unity of command to fully maximize the capabilities of all engineers in the Department of Defense. While some in the engineering community have proposed a permanent Joint Force Engineer Command as the tenth Unified Command, I believe that engineer capabilities are best leveraged with integration throughout the military force as opposed to pooling all engineers in a single command. That being said, unity of command throughout the range of military operations is still a goal we must attain.

In multinational operations, unity of command is usually limited and commanders must concentrate and struggle to achieve unity of effort. Why then, when we have full control of our own C^2, are we doing the same thing with U.S. military engineers?

As discussed above in options 3 and 4, two ways of achieving unity of command are (1) to establish a separate staff element for engineers, or J9, equal in status to the other J-codes and (2) to group engineers not organic to combat units into a single, subordinate engineer component command or subordinate JTF. Establishing one or the other of these options is crucial to efficient, effective, and responsive engineer support to the JFC across the full spectrum of military operations, but by simultaneously instituting both of these alternatives, the JFC will virtually ensure engineering success.

CONCLUSION

"Successful joint operations depend on how effectively commanders employ all resources across the entire range of military operations."[23] The use of military engineers by the JTF Commander is a non-threatening way to project power and show U.S. resolve to all regions of the world. On the operational level, engineers support mobilization, deployment, employment, sustainment, and redeployment of the joint force. From JRSOI to terminating leases and ensuring environmental clean-up, engineers are in theater from beginning to end.

Past engineer operations have been highly successful in spite of the convoluted command and control structure due to the personal relationships established between engineers once on the ground. In recent operations "where [traditional] joint doctrine was followed, engineers strenuously argued the inefficiencies of the arrangement after the mission was complete…opting for either subordination under the J3 [for smaller operations] or establishing themselves as a separate special staff."[24] By changing the way we position engineers within a Joint Task Force, we can simplify command relationships which become paramount to the efficient and effective use of engineering assets.

There are currently U.S. military engineers from all Services in and around Afghanistan. Some are building and maintaining infrastructure for the Marines, some are upgrading MSRs, some are involved in combat engineering tasks, and some are developing infrastructure and alliances in surrounding countries like Kyrgyzstan, Uzbekistan, and Pakistan to continue to show our presence and resolve in the region. With the current war on terror assuredly a protracted conflict, Joint Force Commanders must strive to ensure unity of effort in our engineer forces by correcting the deficiencies in our unity of command.

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