The Need for Joint Engineer Doctrine:

Excerpts from a white paper by the joint engineer community

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The absence of a well-developed program of joint doctrine for contingency engineering threatens the effective employment of forces and needlessly increases the costs and risks inherent in joint and multinational operations.

The Issue

Diminishing resources, reduced force structure, and an increasingly complex geopolitical environment have placed demands on the U.S. military to improve the effectiveness of joint and combined operations. In response, the Joint Staff, Unified Commands, Component Commands and service planners are revising joint and service publications, operations plans, standing operating procedures (SOP), and training programs to reflect these realities. Unfortunately, development of comprehensive joint contingency engineer doctrine and its integration with other joint and service doctrine have not kept pace with these reforms.

The fundamental role of engineering in support of joint and combined operations is not receiving a level of attention and focus consistent with its importance. As a consequence, the full potential of engineering as a critical element of operational maneuver is not fully exploited and sometimes is taken for granted by senior combatant commanders. Consideration of key engineer functions critical to mission success is often absent from senior-level decisionmaking. This absence sometimes hampers engineer staff actions and inhibits effective planning, task organization, and the synchronized employment of engineer resources by joint or combined forces.

Genesis of Contingency Engineering

In the early 1980s, European Command (EUCOM) concluded that an all-out confrontation with the Warsaw Pact would cause keen competition within the joint force for engineer resources and that a mechanism for interservice coordination and setting priorities would be needed. Accordingly, they designated the dominant service in each EUCOM region as Regional Wartime Construction Manager (RWCM), with responsibility for coordinating all U.S. military construction in that region. By CINC directive, each RWCM was to augment its engineer staff with representatives from other services as needed to meet its responsibilities.

As the Cold War came to a close, the U.S. military turned its attention to limited intensity conflicts and military operations other than war (MOOTW). The phrase *wartime construction management* was replaced with *contingency engineering management* to reflect the broader role of military engineering from peacetime contingency to war. The U.S. Central Command (CENTCOM) employed contingency engineering management during the Persian Gulf War. Lessons learned from that conflict and lesser contingencies since then led to contingency engineering initiatives by the other regional CINCs. Today, contingency engineering is viewed within the engineer community as the overarching concept for coordinating joint engineer operations. However, these concepts are not yet fully developed or incorporated into doctrine.

The Critical Role of Engineering

When its full range of capabilities are employed, military engineering can be a significant force multiplier for the combatant commander. It aids overall success by shaping to best advantage a variety of conditions under which military operations must be conducted. In particular, the contingency engineering concept ensures that maximum benefit is obtained from the engineer assets available.

Military engineering provides support to the intelligence and operational planning efforts by analyzing the effects of terrain, hydrology, and infrastructure, and identifying potential targets. It speeds force flow by assessing shortfalls and improving needed facilities, including air and sea ports of debarkation, force-beddown sites, and lines of communication. Military engineering also provides associated facility operation and maintenance and fire-fighting capability. It facilitates operational maneuver and force protection by providing bridging, expeditionary airfields, facility war-damage repair, explosive-ordnance disposal, barriers, and defensive fortifications. Military engineering also plays essential roles in disaster recovery and humanitarian relief operations, environmental compliance and mitigation, and chemical and biological wide-area decontamination.

The importance of military engineering spans the continuum from the strategic to the operational to the tactical levels of war, and the focus of the engineer effort varies accordingly. The CINCs are primarily concerned with the overall deployment of forces in the context of theater war plans. Thus, engineering at the strategic level tends to focus on major facilities, theater-wide construction management policy, and the allocation of scarce engineer resources. At the other end of the spectrum, tactical-level engineering is centered on expeditionary or combat-related activities, primarily of a service concern. Between these two is the operational level (i.e., subunified commands and joint or combined task forces), where campaigns are planned and fought. At this level, there must be balanced emphasis on both deliberate and combat engineer activities.

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To fully exploit military engineering at the operational level, the joint or combined force commander must recognize it as an essential aspect of his scheme of maneuver in an overall campaign plan involving naval, air, and land forces, as appropriate. The object of operational maneuver is to orchestrate movements and engagements to seize, exploit, retain, or deny freedom of action to support the achievement of a common set of objectives. Freedom of action allows the efficient concentration of military capability when, where, and how it is needed; it applies to operations in both peacetime and war. At the operational level, freedom of action can be achieved only through careful planning and seamless execution of deliberate and combat engineer functions in a well-synchronized and, where necessary, integrated effort.

Sufficient engineer resources to satisfy all requirements probably will not be available in all contingencies. Also, the nature of engineer priorities changes as a contingency evolves from reception, staging, and onward movement to force protection, operational maneuver, and ultimately, termination of operations and withdrawal. Resource limitations and the associated challenge of matching requirements with the right capability at the right place and time make it essential that the full range and versatility of all engineer assets be exploited.

Maximizing the use of resources to meet the needs encountered at each stage of an operation will often depend on the flexible use and, when necessary, task organization of troop construction, civilian contractor, and host-nation capabilities as integrated elements of a total contingency engineering effort. Given the unique requirements of a particular contingency, it will also require a well-trained joint engineer staff that is appropriately positioned to most effectively influence the full range of engineer functions.

Deficiencies in Current Joint Doctrine

Despite its importance to the overall success of joint operations and general acceptance of contingency engineering as the overarching concept for coordination of the joint engineer effort by the regional CINCs, there is no clearly defined program of engineer doctrine in the joint publication hierarchy.

What doctrine exists is incomplete and, at times, contradictory.

Joint Publication 4-04, *Joint Doctrine for Civil Engineering Support*, is assumed to be the "capstone" manual and, thus, the primary source of guiding doctrine on joint engineer matters for combatant commanders and their staffs. Though perhaps sufficient as general guidance for engineer management at the CINC level, it falls short of being adequate overarching doctrine across the full spectrum of joint operations. In particular, it fails to present principles underpinning the nature of engineer support for operational maneuver at the joint or combined task-force level and does not address gaps and inconsistencies elsewhere in joint doctrine. Finally, it does not reflect lessons learned from recent operations to the extent that they relate to engineer force organization, staff placement, and operations planning.

Consequently, each regional CINC is pursuing his own approach to contingency engineering, and implementation varies widely. Several major service commands, both active and reserve, have incorporated unique versions of the concept into their SOPs, training, and support relationships. Most recently, both the Army and the Navy have initiated comprehensive efforts to revise their service doctrine to reflect their views of contingency engineering considerations. USACOM, in its expanded role as joint force trainer, has independently established a training program for contingency engineering staff. These efforts are positive in that they serve to develop and promote application of the contingency engineering concept, but they are not coordinated with one another and lack a common base in joint doctrine.

The inadequacy of Joint Publication 4-04 as overarching doctrine becomes clearer when viewed in light of the key elements of military engineering it does not fully cover but that are considered significant enough to be addressed in other joint publications, typically in the operations or "3" series. They include, but are not limited to, Joint Publication 3-10, *JTTP for Rear Area Operations*, and Joint Publication 3-10.1, *JTTP for Base Defense*, which address aspects of survivability and sustainment support engineering. Also significant is Joint Publication 3-15, *Barriers, Obstacles, and Mine Warfare*, which deals with achieving operational advantage through mobility and countermobility engineering.

There are also significant gaps in joint guidance concerning areas such as topographic engineering, engineer intelligence, common design standards, real-estate acquisition, environmental mitigation, disaster recovery, wide-area decontamination, and engineer support for deep operations and targeting (i.e., employment of FASCAM and future intelligent wide-area munitions).

Logistics Paradigm and the Engineer Staff

Perhaps the most significant impediment to full and effective use of engineer resources in any contingency arises from the traditional view that, aside from the most basic combat-related tasks, engineering is predominantly a logistics function that is primarily concerned with the construction of facilities in support of the sustainment effort. The only joint guidance available, Joint Publication 4-04, reflects this view and is replete with references to "civil engineering" and "facilities," but noticeably silent with regard to the engineer functions of mobility, countermobility, survivability, and topographic engineering as these relate to support of combat operations. This logistics paradigm is reflected in the staff organizations of major combatant and service commands, where engineering typically is a J4 function.

Four of the five regional CINCs have placed engineering under the J4 and have developed internal policies for contingency engineering based on this approach. The J4 model may be workable at the strategic or CINC levels, particularly in peacetime when the focus is on deliberate planning and facilities development. However, recent experience indicates this approach does not always work during contingencies. This is particularly true at the joint task- force level. Given the nature of current guidance, joint force commanders have a tendency to view the engineer function in its strategic (sustainment engineering) or tactical (combat engineering) extremes. They often fail to recognize or fully capitalize on the advantages of a total engineer effort that is integrated as an essential part of their operational scheme of maneuver. Thus, joint task-force staffs are often organized accordingly.

At the joint task-force level, when subordinate to the J4, the staff engineer is not well positioned to coordinate or monitor the total contingency engineering effort in support of operational maneuver. 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. The result tends to be engineer support for the joint force shaped solely through the eyes of the logistician, whose primary focus is on just one key aspect of the joint campaign: force sustainment. Placement within the J4 staff increases the likelihood that the full value of engineering will not be realized and that key engineer-related issues may not surface to the joint or combined force commander in time for resolution.

Neither Joint Publication 0-2, *Unified Action Armed Forces*, nor Publication 5-00.2, *Joint Task Force Planning and Procedures*, specifies staff placement of the engineer in the joint force structure. While Joint Publication 0-2 assigns supervision of engineer functions to the J4, Joint Publication 5-00.2 is contradictory on joint staff responsibility for engineering. It states that J3 responsibilities include mine warfare; reconnaissance; rear-area protection and security; disaster relief; and mobility, countermobility, and survivability operations, all of which are heavily engineer-related. However, it also states that J4 responsibilities include engineer reconnaissance and intelligence, bridge and river crossings, barrier operations, general construction, and base development and maintenance. Aside from base development and maintenance, each of the other responsibilities assigned to the J4 is more operational than logistics in nature and overlaps considerably with those of the J3.

Although neither Joint Publication 0-2 nor Joint Publication 5-00.2 specifies placement of engineers, both publications reinforce the joint force commander's prerogative to organize the staffs as necessary to accomplish the mission. In the few recent instances where the joint force staff engineers were placed outside the logistics organization (i.e., as special staff), the wisdom of affording the engineer greater independence was ultimately validated.

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Joint Training

Fundamental to the nature of joint operations is the need to tailor force packages and command structures to suit the situation at hand. Although the joint force engineer staff initially may be built around the headquarters element of the dominant component command, this staff typically is augmented with individuals drawn from other components and agencies. Since the makeup and level of competence of the engineer staff is critical to the ultimate effectiveness of the total engineer effort, it is important that these individuals have a common basis for interacting as a team. Gaps and inconsistencies in current joint doctrine and the lack of joint engineer staff training programs make this requirement difficult to achieve.

To a greater or lesser degree, regional CINCs and major component commands have established directives and SOPs to provide local guidance on contingency engineering operations, but approaches vary widely. It is apparent that these differences are not only due to the unique characteristics of a given area of responsibility (AOR) but how, in the absence of adequate guiding doctrine, alternative views on the concept of contingency engineering have evolved over time. The lack of some appropriate level of uniformity in the application of these principles serves to confuse staff augmentees and may result in conflict between the way a major component command and a regional CINC plan to conduct their operations.

The lack of relevant doctrine and the limited number of personnel experienced in joint contingency engineering operations, combined with the usual staff turbulence, causes a situation where the same lessons are relearned over and over. Opportunities to train service personnel in contingency engineering concepts are few. Engineers typically are not permitted a strong presence in joint exercises, and engineer issues are most often assumed away by operational commanders. Although some major reserve organizations have the mission and capability to train and provide engineer staff augmentation (i.e., the Army Reserve's engineer commands and the Reserve Naval Construction Force Support Command), these organizations will not be the first to provide personnel to go "down range." A larger pool of active duty engineers from each service must be trained in contingency engineering techniques. However, this assumes a common base in joint doctrine and interservice compromise on engineer staff practices.

In its role as joint trainer for assigned CONUS-based forces and joint task force staffs, USACOM has developed and implemented a program of instruction (POI) for *Engineer Support to Joint Task Forces*. In addition, the Army's Battle Command Training Program (BCTP) concept is being adapted to exercise joint task force commanders and staffs. This "JBCTP" focuses on joint staff practices, planning, and doctrine as well as tactics, techniques, and procedures. The USACOM POI and the engineer component of the JBCTP are important steps forward in providing platforms for joint contingency engineer training. However, these initiatives have been largely shaped from the perspective of the organizations that developed them. They do not reflect input from other combatant CINCs or the major service commands with direct experience in contingency engineering operations. Developed in the absence of clear joint guidance as their foundation, these initiatives run the risk of becoming joint doctrine by default.

Conclusion

In an era of reduced force size and limitations on strategic lift, it cannot be assumed that a joint or combined force will have enough engineer resources when and where they are required in a contingency. Therefore, it will be essential to get the most out of the resources available. The future development of joint engineer doctrine should do everything possible to support this need.

Existing joint doctrine is incomplete and fragmented. This, along with the view that engineering is primarily a logistics function with an emphasis on force sustainment, has hampered the efficiency of the total engineer effort in support of operational maneuver. These factors pose important implications for the successful planning and execution of future joint and combined operations. Steps must be taken now to systematically improve joint doctrine, engineer planning systems, and staff training programs to flexibly meet the needs of current and future contingencies.

Recommendations

1. Publish more effective guidance for joint engineer operations; fully develop the concept of contingency engineering to reflect its evolving practice in the field.

a) Revise Joint Publication 4-04, *Joint Doctrine for Civil Engineering Support,* as an interim measure and develop a new publication to serve as overarching engineer doctrine.

b) Ensure coverage of the full span of engineer functions—mobility, countermobility, survivability, topography, and sustainment—in support of operations.

c) Define the broad role of the engineer in deliberate and crisis action planning and execution, to include support for the intelligence, operations, and logistics efforts.

2. Propose principles and options to guide joint commanders in staff organization and placement, and emphasize early involvement, freedom of action, and ongoing visibility.

a) Propose revisions to other publications to ensure that references to engineering throughout the doctrine hierarchy are consistent with the concepts outlined in new, overarching doctrine.

b) Revise Joint Publication 0-2, *Unified Action Armed Forces*, to elaborate on the importance of exercising flexibility in the position of the staff engineer in accordance with the needs of a given contingency.

c) Revise both Joint Publications 0-2 and 5-00.2, *Joint Task Force Planning and Procedures*, to resolve the ambiguity and/or potential conflict in responsibility concerning engineer matters between the joint task force J3 and the J4.

d) Revise Joint Publication 5-00.2 to outline the principles and options governing engineer staff placement and functions.

3. Develop joint tactics, techniques, and procedures (JTTP) to amplify concepts presented in a revised and/or new publication and to fill specific gaps identified in engineer doctrine.

a) Revise existing JTTPs and those in development to reflect the concept of contingency engineering and related principles, as presented in new overarching doctrine.

b) Evaluate the need and propose new JTTPs covering such topics as, but not limited to, topography, environmental mitigation, civilian contracting, real estate, wide-area decontamination, disaster recovery, and design standards.

4. Pursue a comprehensive strategy to increase knowledge of and competence in joint contingency engineering operations among combatant commanders and engineer staffs.

a) Establish a formal training program for joint force engineer staffs, building on work already completed by USACOM and the Army's Battle Command Training Program.

b) Promote a stronger role for engineers in Joint Chiefs of Staff-sponsored exercises and consider formulation of an ongoing engineer exercise program to run in parallel.

c) Introduce contingency engineering concepts and familiarization with emerging doctrine in the syllabus of service and joint command schools.

"Engineers Lead The Way!"