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STUDENT ESSAY

WILL THERE BE ENGINEERS FOR THE NEXT BATTLE?

BY

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US ARMY WAR COLLEGE, CARLISLE BARRACKS, PENNSYLVANIA

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USAWC MILITARY STUDIES PROGRAM PAPER

WILL THERE BE ENGINEERS FOR THE NEXT BATTLE?

INDIVIDUAL ESSAY

by

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10 February 1986

ABSTRACT

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As the Army prepares for what all hope will never come--the next war, it developes new concepts and organizations. These activities are aimed at making the Army a more efficient and destructive force than ever before. Although much has been written and considerable discussion has taken place by active and retired military personnel, as well as, qualified civilians concerning the merits of these changes, only time will validate the results.

The current direction for change aims at making our Army more able to meet its world wide committments, while remaining within a fixed manpower end strength of 781,000. This action was taken to more closely control the dollar expenditures in the personnel arena while utilizing available funds to modernize the Army. Subsequently, the Army was forced to make trade-off decisions stemming from the assignment of a number of additional missions. The need to create a more versatile force structure, maintained within the established end strength, dictated the decisions to transfer certain active duty forces to the Reserve Components. One of the segments of the force in which there has been a steady reduction is that portion which has allowed the Army to carry out its missions in the remote corners of the world. In this instance I am referring to the Army's Corps of Engineers. The continued reduction in the active Engineer force may have placed in

jepardy the Army's ability to meet the goals upon which so much of today's thinking is based.

History has shown that our Army has traditionally placed a heavy reliance on the Corps of Engineers. For example, in the European theater during World War II one US Army soldier in every nine was an Engineer. Despite the personnel shortages that existed in their numbers throughout the war, the engineers remained the largest single component of the divisional slice outside of the regular combat troops. Large numbers of engineer troops were present in the other theaters as well. One in eleven soldiers in the Mediterranean theater and one in seven in the Southwest Pacific were engineers.[1] The increase in the number of engineer troops in the Southwest Pacific was directly attributable to the increased requirements resulting from the lack of national infrastructure in that area of the world. Our experiences in Vietnam reconfirmed the significant need for engineers when our Army is confronted with military action in a third world environment. Yet today we only have 35,425 engineers on active duty. That is but one in every 22 soldiers.

History records that other nations have also relied heavily on their engineers. The British used their engineers extensively throughout their Empire to develope the road and rail infrastructure necessary to operate in

those areas. During World War II the German, British and Soviet armies engineers played important roles on all fronts. As stated in Paul Carell's book Hiter Moves East, due to the necessity for engineers to aid in the movement requirements across the roadless steppe it was: "an assault detachment of the Engineer Battalion 62 as part of the 2nd Panzer Division that got closest to the Kremlin. The unit penetrated into the suburb of Khimki to the first stop of the Moscow tramway only five miles from the outskirts of the city and ten miles from the Kremlin." Engineer forces remained a key element of the Wehrmacht force structure even as the German Armies began their disintergration during the later stages of the war.

We look today at being able to conduct military operations in all areas of the globe. This is a substantial mission change from the predominate view which Europe has occupied in the past. However, have we adequately considered the engineering support that will be necessary to commit and sustain such a force? The vast majority of the world does not have the national infrastructure (roads, airfields, ports, etc.) to permit the sustainment of our armed forces. The quanities of

supplies necessary to commit and sustain such a force will over tax the meager infrastructure of a third world nation. This fact was clearly highlighted by Margaret Daly Hayes in her 1980 article entitled "Security to the South: U.S. Interests in Latin America". Dr. Hayes concludes, that much of the cause for many third world nations remaining in their under developed condition, is due to the "generally inadequate road and airfield infrastructure, maintenance facilities, and problems of re-supply by foreign manufacturers all serving as constraints."[3] Our concern must be the extent to which the Army's engineers retain their ability to deal with these problems and how this affects the decision making process. The nation cannot afford to rule out the consideration of the use of the military force when dealing with concerns of national interest. The use of the military must remain as an option available to the National Command Authority.

A review of the risk assessments being prepared support the position that the most likely committment of forces would be in an unconventional or a low-intensity conflict (Figure 1). This assessment supports the argument that it will be necessary to commit a sizeable engineer

force to be able to adequately provide the national infrastructure to sustain our forces. Figure 2 denotes the estimated daily quantities of supplies needed per type of organization. The national infrastructure of possible third world nations, where a deployment could be considered possible, is shown in figure 3. These data indicate that the lack of an adequate infrastructure in these nations would require a substantial engineer committment in order to insure the success of a military operation. Additionally, the speed with which these facilities are completed will significantly impact on our ability to sustain the force. For example, although road construction may seem to be a rather mundane task which can proceed quickly with today's modern equipment, one must consider the variables, such as terrain and weather conditions. For example, due to the harsh weather conditions and the long supply lines, inspite of nearly the unlimited monetary and equipment resources available, the construction of the road to Alaska's North Slope in support of the 1974 oil discoveries at Prudhoe Bay required 154 days.[4]

If we look to the Corps of Engineer's experience in Vietnam, it could be used as a template for an estimate of

the engineering effort necessary to support a military committment in a third world nation. In November 1965 MG Robert R. Ploger, then the US Army Vietnam, Engineer, assessed the engineering needs required in Vietnam. At that time he estimated that 170 battalion-months of engineer work had already been identified.[5] This work involved the construction of those logistical facilities necessary to sustain Vietnam's armed forces and an expected US fighting force of three or four divisions. It should be noted, however, that this estimate did not include any estimate of the engineer support required in support of combat operations nor any construction effort required by the Air Force. Although it can be argued that this estimate included the effort required to provide the US forces with cantonment areas, which may not be required in a current day commitment, the majority of the estimated work was directed at the construction of roads, bridges, airfields, port facilities, hospitals, and maintenance and supply facilities. A similiar effort today would most certainly be necessary to sustain a force committed in a third world nation.

The removal of more and more engineers from the active

force places a greater reliance for engineer support on the Reserve Components. Perhaps some of the reasoning for this transfer comes from the perception of many senior officers that, "the Engineers are a good example of the use of Reserve and Guard forces as those individuals merely carry over their civilian occupations into their military units." Nothing could be farther from the truth. Although some of the officers do have Engineering degrees, the vast majority of the officers and enlisted personel are not in any way associated with engineering or construction as part of their civilian occupation. The estimates vary, as to the number of engineer personnel whose civilian occupation is similiar to their military MOS, but the majority of these do not excede thirty percent. This relationship, therefore, does not appear to be a valid reason for transfer of units into the Reserve Components.

The result of this reduction in the size of the active engineer force has been to place approximately seventy four percent of the Army's engineer assets in the Reserve Components. When one considers the number of engineer units in Europe assigned in support of USAREUR, the remaining active engineer units in CONUS readily available

for rapid deployment has been significantly reduced. Another consideration, which must be examined, is that many of these CONUS based active engineer units are themselves supplemented by the Reserve Component companies. These roundout companies may be located near their parent Battalion but in most cases they have not had the training time available, either for their own individual and collective training or the field training with the Battalion, to allow them to rapidly deploy as a viable part of the unit. Additionally, in the case of the roundout companies the legal considerations concerning the activation of the Reserve Component forces must be solved prior to their deployment as part of the Battalion. These factors have left many of our CONUS based engineer units critically short of capability. Their organizational structure has been reduced by one company and the loss of that company's equipment from the active roles inhibits the rapid reconstitution of the unit.

If we continue to review the combat capability of the active CONUS based engineer units, it will be noted that a number of factors, other than the mere transfer of active units into the Reserve Components, affect the active

engineer's ability to perform its combat support missions. These factors include equipment status and modernization, maintenance, and officer grade structure.

The equipment situation for those units remaining in the active force must be considered critical. Currently the active engineer organizations are functioning with vehicles and equipment that is grossly outdated. Five ton dump trucks that were manufactured in 1966 are not uncommon. Bulldozers and related construction equipment with a manufactured date prior to 1970 is the rule rather than the exception. Standard engineer tools of the trade needed to support the mobility mission such as mine detectors and minefield breaching materials are either outdated or nonexistent. The inadequacies of the current engineer equipment were poignantly highlighted by LTG Robert L. Wenzel, Commanding General, V Corps, in his discussion of the engineer support to a recent Reforger exercise. He stated that, "Todays combat engineers lack many of the modernized systems needed to properly support the tactical commanders. The engineer's need for fast demolitions and an expedient method of breaching obstacles were highlighted in the various counterattacks conducted

during the exercise. It became quite obvious, that the breaching of minefields, the rapid crossing of gaps on the battlefield and the reduction of strong points, are engineer missions that can be accomplished now only with Korean War technology."[6]

The much vaunted arrival of the all purpose engineer vehicle, the ACE, which is forcast to solve many of these problems, appears now to be a victim itself of the planned budget cuts. Although under development for some time, the ACE has just recently begun limited production. The Corps had programed for 2500 of the vehicles. This program has now been terminated early with only 500 vehicles scheduled to be manufactured.

Another factor, which affects this delicate balance, concerns the maintenance required to provide the equipment availability necessary for the unit to perform its mission. As the engineer equipment ages, it requires more and more maintenance effort. This, however, is not consistent with the current trends in today's Army. As new systems are developed, a greater amount of diagnostic equipment is being installed in the equipment and is being provided for

use by the mechanics. As a result of these new concepts, the number of maintenance personnel within the engineer motor pools has been reduced. This was done without regard for the fact that the old engineer equipment has no internal diagnostic equipment nor is any available for external use. The ultimate result is the improper utilization of soldiers as members of the engineer squads who are transferred to the motor pool to accomplish maintenance tasks.

A third factor which faces the engineer, when dealing with his old equipment, is often the lack of availability of repair parts. This in part is caused by the demise of many of the firms that originally manufactured the equipment but is exacerbated by the low denisity and wide variety of equipment within each unit. This causes enormous problems for the supporting maintenance facilities and results in significant amounts of non-available time for equipment requiring major components.

The resulting effects of this lack of modern equipment and projected budget decreases does not argue well for the ability of the Corps to meet future missions. Already

equipment shortages have caused the transfer of equipment between Battalions. Prior to the deployment of the 46th Engineer Battalion to Honduras in 1983, engineer equipment was transferred from other active Battalions to bring the 46th up to strength. The transfer of this equipment significantly impacted on the combat readiness of losing units.

Another element affecting the combat effectivness of our active engineer units which must be considered is the assignment of Engineer Captains to the S-3 positiions in lieu of the traditional assignment of a Major. Inspite of the fine Captains available for these assignments, their reduced experience level reduces their effectivness. The loss of the second Major within the battalion has increased the workload of both the Commander and the Executive Officer. Additionally, the commander must now adjust his concept of the operation to take into consideration the availability of only one other field grade officer and the inexperience factor of a major member of his staff.

The vast reliance on the nonactive force now places time as a critical element in our considerations when

committing a force overseas. The activation time of the forces must be considered as well as the training time necessary to attain ARTEP deployable standards. Initially, we must be assured that an overseas commitment will be supported by the nation. The aim of the current law is to insure that the nation does not find itself in another Vietnam situation whereby a President is determined to fight a war without drawing the resources necessary from the non-active force structure and rallying the support of the nation. The President must be willing to risk his political future and promptly activate sufficient Guard and Reserve forces to properly support the committment. According to current law the President can activate 100,000 Reserve Component soldiers for 90 days without the approval of Congress. The question arises as to whether or not a President will have the personal will to do this or will he rely on the 90 days in hopes that it is sufficient time to activate and deploy an Engineer force, provide it time to accomplish its mission, and return it to its home station.

Additionally the status of the training of the non-active force must be considered with respect to time in view of the current ARTEP training standards. The list of

Engineer ARTEP training tasks is extensive. Can we expect the non-active Engineer forces to be trained to the necessary extent required for rapid deployment considering units have only 39 training days per year? It may well be impossible under the current training directives to maintain a unit's proficiency at such a level as to allow that unit to be scheduled for an early deployment date.

We have recently had evidence that Reserve Component engineer forces can function as a committed force. Engineer units from three southern states have been committed as part of exercise Blazing Trails for major road construction in Panama. The results of this committment have been excellent, however, it does not eliminate the concerns over the time required to prepare the unit for deployment overseas. Prior notice was provided to these units and they were committed piecemeal in order to maintain a continuous operation. In this same light five National Guard engineer units were activated during the Vietnam crisis. Two of these units were subsequently deployed to Vietnam. The 116th Engineer Battalion (Combat) (Idaho) underwent nine weeks of training at Fort Lewis, Washington prior to deployment and the 131st Engineer

Company (Light Equipment) (Vermont) underwent four months of training at Fort Belvoir, Virginia prior to deployment to the Central Highlands.[2] The level of training required prior to the deployment of these units may be inconsistent with the current belief that Reserve Component engineer units will be able to deploy shortly after arrival at their designated mobilization station.

What then will be the results of our reorganization? It does not appear that we can be certain of the results at this point short of comfirming that many problems exist. It is remarkable, that after the emphasis engineers have placed on the tactical commanders to be included as part of the combined arms team, we now face a situation whereby those very engineers may not be able to perform the missions required. Evidence indicates that most of the tactical commanders are aware of the combat multiplier effect of the inclusion of the engineers in their battle plans. No where has that fact been more vividly pointed out than at the National Training Center. Commanders have gained the first hand knowledge of the positive nature of engineer support. It appears, however, that after all of this efforts, we may be turning a corner which leads to an

avenue whereby engineer support of the tactical commander may again become insufficient. For the sake of our soldiers, the Army and the nation this can not be allowed to occur.

A SPECTRUM OF CONFLICT

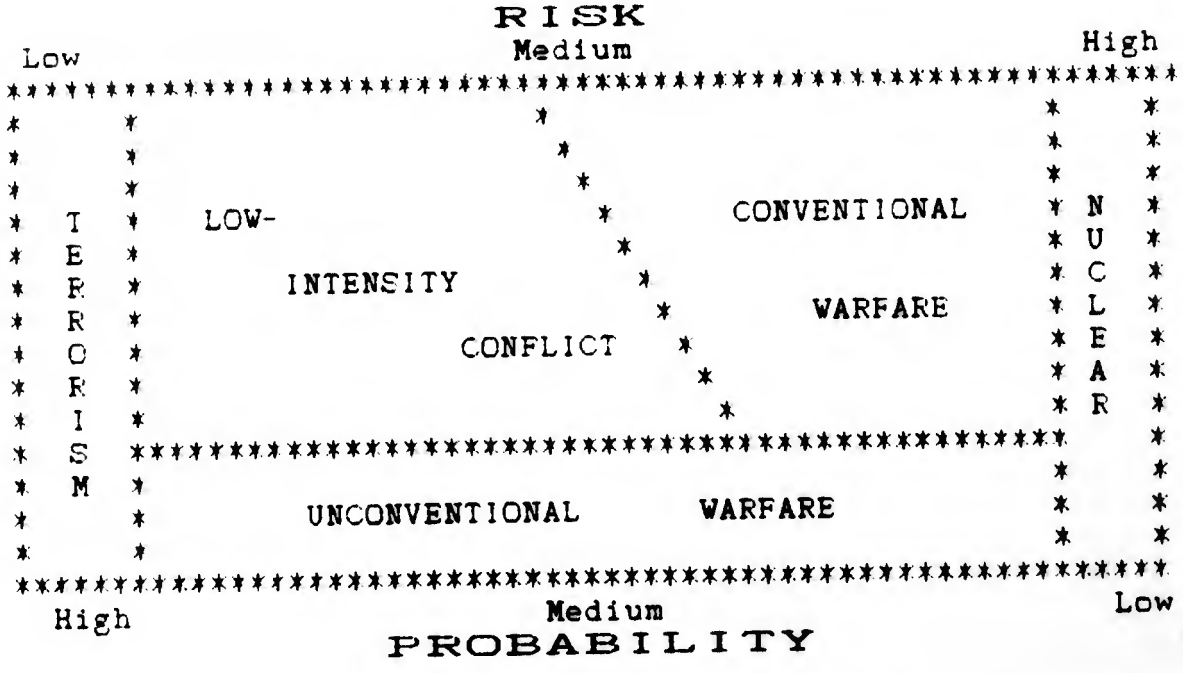

FIGURE 1

SUPPLY REQUIREMENTS

TYPE DIVISION	OGRANIZATIONAL ITEMS (TONS)	SUSTAINMENT ** (TONS/DAY)		
		<D+30	D+30-D+60	>D+60
INFANTRY	33,000	452	346	243
MECHANIZED	66,700	734	562	395
ARMORED	88,200	721	552	389
AIRBORNE	21,600	477	365	257
AIRMOBILE	21,900	575	440	309

** Sustainment figures do not include the requirements for ammunition.

FIGURE 2

NATIONAL INFRASTRUCTURE

NATION	10,11 PORTS	12 AIRFIELDS	13 RR(Km)	14,15 ROADS
SUDAN (G)	1(B,C)	5	4786(F)	W,X,Z
SOMALIA	3(B,D,H)	4	None	W,X,Z
KENYA	2(D)	5	2084	Y,X
TUNISIA	5(A,B,H)	5	2013(A)	Y,X
EGYPT	2(B,D)	19	4321	Y,X
OMAN	1	4	None	W,X
IRAN (G)	5	24	4567	Y,I
ZAIRE	1(B)	8	6169(F,A)	W,X,Z
ANGOLA (G)	3(A,B)	4	2798(F,A)	X,I
NIGERIA	4(B)	6	3523(F)	X,Y,Z
THAILAND	2(D)	12	3735	Y
MALAYSIA (Malay)	2	4	1659	Y,X
INDONESIA (Sumatra)	1(B,C)	3	2000(F)	W,X
COSTA RICA	2(B,C)	1	700(F,A)	Y
EL SALVADOR(G)	1(B,C)	5	602(F,A)	Y
HONDURAS	4(D)	2	1202(F,A)	Y
NICARAGUA(G)	3(B)	2	344	Y,G
PERU (G)	4(D,E)	8	1877(E,A)	Y
EQUADOR	3(B,C,D)	4	965	Y
BOLIVIA	0	7	3228(E,A)	Y

A. Primarily bulk handling i.e. ore, grain, oil.
B. Conditions limited i.e.berthing, exit roads, storage
C. Limited off-loading equipment.
D. One main port facility
E. Facilities serve other nations.
F. Poor/ limited condition
G. Subject to insurgent or hostile operations.
H. No containerized freight handling capibility.
I. Conditions unknown
W. Marginal/non-existant outside major cities, 4WD required
X. Roads subject to closure (rainy season, blowing sand)
Y. Paved road net between major cities, 4WD on secondary
Z. Little or no road maintenance

FIGURE 3

ENDNOTES

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