ENFORCE Breakout Sessions Tackle Regimental Issues

By Lieutenant Colonel Susan Myers and the ENFORCE Team

Have you ever wondered what really happens at an ENFORCE conference? Breakout sessions held throughout the conference are part of an Engineer Regiment initiative to pull together all of the experience, great ideas, and issues discussed at the conference. The feedback generated from these sessions is then incorporated into the Engineer Regiment's strategic plan. Eight sessions were conducted during ENFORCE 97: Doctrine Development, Trend Reversal and Engineer Qualification Tables, Heavy Division Engineer Redesign, Light Engineer Force Structure, ACE and SEE Readiness, Integrated Concept Team (Combat Heavy), Bridging, and Countermine Concept.

Breakout sessions provide a forum to inform personnel about ongoing schoolhouse initiatives, solicit feedback, and formalize strategic planning efforts for issues critical to the regiment's success. This year participants selected the sessions they wanted to attend from the ENFORCE agenda and most came prepared for the discussions, which resulted in some lively debates. This was the first year that U.S. Army Corps of Engineers (USACE) division and district commanders participated in the sessions, and we intend to include more USACE topics next year. Highlights of the sessions follow.

Doctrine Development

By Captain Shawn Howley

The session concentrated on publications currently under revision. Feedback and insights gained from the discussion will provide a great resource for authors as they develop these warfighting manuals. Three manuals were discussed:

***Joint Publication 3-34,* Joint Doctrine for Engineer Operations.** We discussed Chapter II, "Joint Engineer Fundamentals," which joint force commanders should consider when planning and executing engineer operations that parallel, support, or enhance the strategic goals and campaign plan. Attendees were invited to review Chapters II and III and submit comments by 15 May. These chapters appear on the Engineer School's home page at http://www.wood.army.mil/DDD/JOINT/joint.htm.

***FM 90-13-1,* Combined Arms Breaching Operations.** We discussed the breaching challenges facing commanders, the theory behind breaching operations, and the various types of breaching operations available to commanders. The group provided input on planned changes in breaching fundamentals and organizations that the author is making in the field manual.

***FM 20-32,* Mine/Countermine Operations.** This manual provides U.S. armed forces with technical guidance for conducting mine and countermine operations and emphasizes maneuver and engineer staff planning and coordination. It will be used by all elements of the combined arms team.

Trend Reversal and Engineer Qualification Tables

By Captain Darrell Strother

We began with a demonstration of the "Trend Reversal" compact disc (CD) developed by the Engineer School's Combined Arms Branch. This user-friendly CD will help units reverse problem trends identified at the combat training centers by identifying some tactics, techniques, and procedures to correct them. The CD is scheduled for distribution via Internet by January 1998.

Resource issues dominated the discussion concerning the Engineer Qualification Tables (EQT) (see chart). The major issue was the Engineer School's position to constrain development of the EQT by the resources provided in DA Pam 350-38 (STRAC manual). No consensus was reached by the group, and we will continue to study the issue. Another point of discussion is apparent redundancy in the tables. Active Component units want to eliminate redundant tables. The Reserve Component units represented at the session want to maintain some redundancy to allow for both unit certification and qualification.

Comments gathered during the session will be used to revise the EQT. Draft copies will be fielded to selected units for comments, and the final EQT will be presented to the commandant for approval.

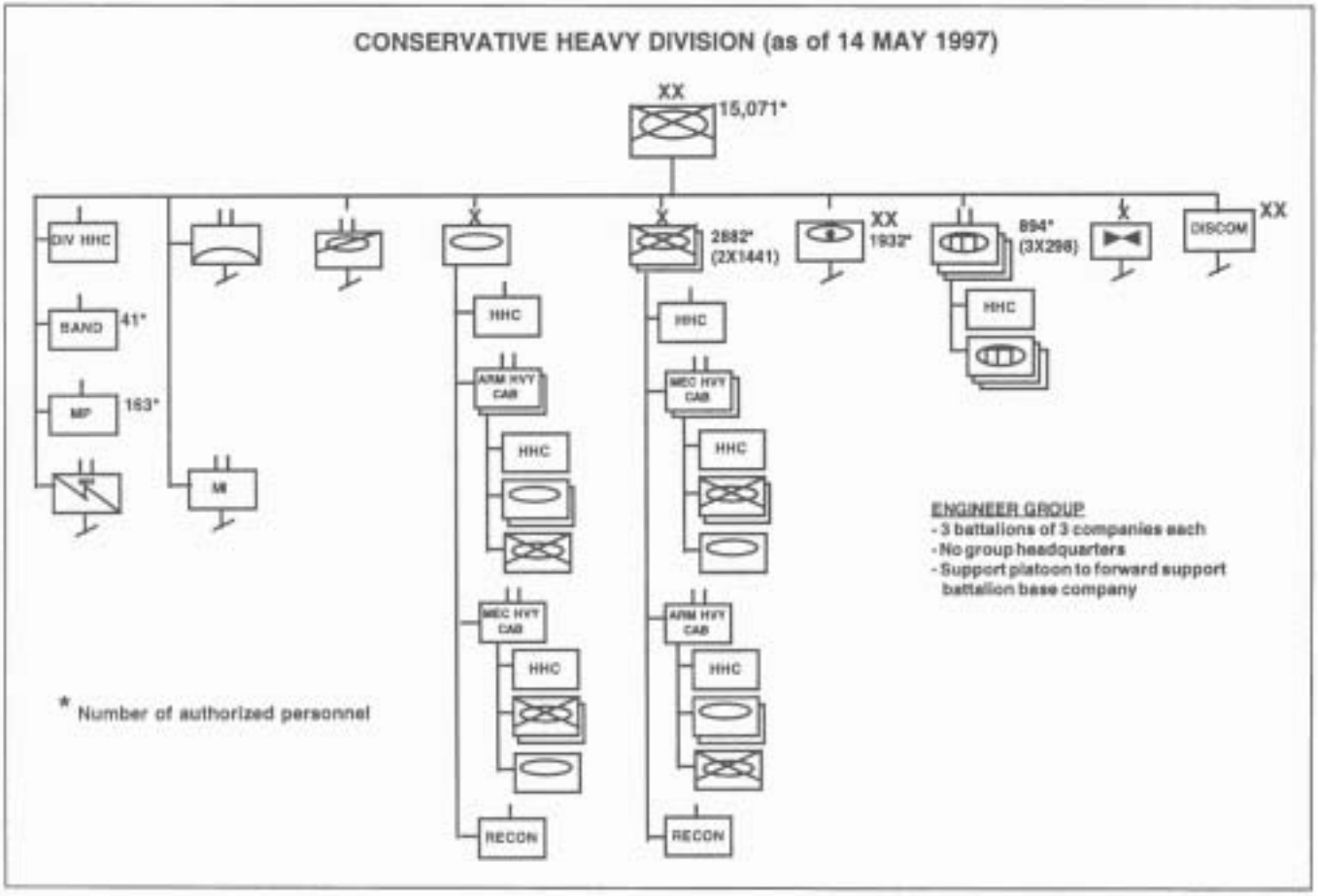
Engineer Qualification Tables	
Number	*Title*
I	Individual/Crew Weapons Qualification
II	Leader Demolitions and Mine Qualification
III	Individual Demolitions and Mine Certification
IV	Individual Demolitions and Mine Qualification
V	Preliminary React to Contact
VI	Preliminary Training Course
VII	Intermediate Certification Course
VIII	Intermediate Qualification Course
IX	Advanced React to Contact
X	Advanced Training Course
XI	Advanced Certification Course
XII	Advanced Qualification Course

Heavy Division Engineer Redesign

By Vern Lowrey

The engineer force structure is evolving to support the Force XXI heavy division.The conceptual heavy division engineer design includes Bradley fighting vehicles, Grizzly breachers, and Wolverine heavy assault bridges. The design also includes some fixes to the current heavy division engineer battalions, such as the addition of an S2 officer, a battalion maintenance officer, and a robust engineer reconnaissance capability. The battalion will focus exclusively on support to obstacle breaching operations. Extensive reinforcement from engineers at echelons above division will be required for other engineer functions.

During the ENFORCE Conference, TRADOC announced a decision by the Army Chief of Staff to provide three engineer battalions in support of the three maneuver brigades in a "conservative heavy division" design (see chart below). This design does not include a separate division engineer brigade or group command headquarters. The conservative heavy division design will be used during the Division XXI Advanced Warfighting Experiment (AWE) at Fort Hood, Texas, in November. It and two other designs (strike division and brigadist division) will be analyzed by the TRADOC



Analysis Command (TRAC) before the end of September, as part of the Division Design Analysis, Phase III, process. The strike division design includes an engineer group that commands six engineer companies. The brigadist division design attaches an engineer battalion to the maneuver brigade but has no engineer brigade headquarters. TRAC will analyze only combat capability (not battle command). The Engineer School will attempt to provide TRAC with needed battle command insights observed during the Division XXI AWE. This AWE will determine the need to retain the engineer brigade command structure in the heavy division.

The heavy division will require the capability to acquire and use an increasing load of digital terrain data to support Force XXI operations. We identified the need to manage digital terrain data at both division and brigade levels to provide needed terrain analysis and terrain evaluation support for the Army Battle Command System. Current Force XXI experiments show that terrain analysis teams equipped with Digital Topographic Support System equipment are required at both the division and maneuver brigade levels.

Light Engineer Force Structure

By Peter Malley

Redesign of the light force structure was the main topic of discussion. Rather than make small fixes, we agreed to fix what is broken throughout the light force. By doing this, we will examine the total force requirement to determine units that are no long required or where missions may be reassigned to acquire "billpayers" to fix broken units.

Much discussion occurred when we displayed the engineer support structure programmed to light forces. All attendees understood the type of support units will receive when they go to war. We explained how doctrine drives their requirements in the total force and that we will correct the doctrine if necessary.

We discussed changes proposed by the light community and agreed to work with the 20th Engineer Brigade, Fort Bragg, to develop a concept for submission during the Force Design Update Process (scheduled for summer 1998). Engineer division commanders expressed concern about possible changes to the engineer light equipment company. They feel this unit is in good shape and should not change.

The Engineer School will continue to work with the 20th Engineer Brigade on proposed changes to the light force structure.

ACE and SEE Readiness

By Major Lewis Setliff III

The diverse audience included equipment users, commanders, and representatives from the Marine Corps, Theater Army Area Command (TAACOM), and the manufacturer. Our objectives were to—

- Provide commanders with systems to improve readiness.
- Update trends and acquire field input.
- Distribute a CD-ROM about M9 ACE maintenance.

We discussed initiatives in training, supporting, and operating the ACE and SEE that will increase their operational rates. We described current training requirements; maintenance techniques; and future initiatives on parts acquisition, operator and mechanic training, and doctrinal employment. Specific comments follow.

Training teams. The Army no longer funds maintenance and operator training teams—that is now a unit-level cost. Commanders reported that the teams are worth the cost and effort. While the operational readiness rate may drop immediately after a training team visit (due partly to increased knowledge of the operator or mechanic), overall rates soon should rise.

Schoolhouse focus. The Engineer School will remain focused on training and organizational support. Training includes required operator, mechanic, and sustainment training. Organizational support adjusts appropriate TOE/TDA levels to support equipment. We agreed that the organizational structure needs improvement and training needs frequent adjustments, but current initiatives adequately address these issues.

ACE CD-ROM. The CD-ROM for M9 ACE maintenance was demonstrated and issued to attendees. It was well received and should be a tremendous asset to units.

ACE system-unique parts. We must improve the readiness of this equipment and "pull" information from the user on why equipment fails. Users should complete in detail the data sheets that accompany parts orders so that materiel developers know why a piece/part failed (operator error, malfunction, or mechanical error). This information is critical. Units must document problems properly to weight the effort in resolving systemic problems. Materiel developers should apply the requirement for each part to meet the "form, fit, and function test," and those present agreed that user feedback will assist in this effort.

Local purchase of parts. Local purchases do not create a demand on the Defense Logistics Agency (DLA) and therefore adversely impact supply availability. DLA *must* be aware of our actual demand.

Reduced prescribed load list (PLL) initiative. Reduced PLL may adversely affect ACE/SEE readiness due to their low density and operational requirements. We must closely monitor parts availability and their effects on readiness and consider an exception to policy.

Special tools and equipment. The availability and function of special tools and equipment impact readiness. TAACOM will soon propose that special tools, such as those for the ACE and SEE, be part of a kit, outfit, or set.

Direct support (DS) maintenance operations. DS-level maintainers must not be left out of the loop for maintenance training, special tools, and enhancements such as the CD-ROM.

Integrated Concept Team (Combat Heavy)

By Major Shep Barge

This session described the purpose of the construction integrated concept team (ICT) and discussed the needs and desires of combat heavy and construction engineer units in the field. Major conclusions follow.

Procurement

- Most participants urged us to maximize the use of commercial construction equipment to accelerate the acquisition process and improve parts availability throughout the life of equipment.
- Participants agreed that the SEE is not suitable for combat heavy units. They want a sturdy, commercial backhoe in its place.
- Contractor/vendor support is necessary for any deployment. Interaction with vendors would be easier if all construction equipment was from the same company (however, contracting laws do not allow this). One participant noted that he was unable to use his International Merchant Purchase Authority Card (IMPAC) while deployed to Bosnia. The loss of this productive tool made it difficult to obtain repair parts for construction equipment.
- Units are frustrated that fielding plans for construction equipment often are lengthened because of the need to convert commercial manuals to Army standards. They agreed that new equipment should be fielded as soon as it is physically available, even if that means fielding with a draft manual. Participants agreed that paper manuals are still needed but that manuals on CD-ROMs should be distributed to encourage their use.



Palletized loading system transporter

Combat Developments

We discussed the concepts and particulars of upcoming construction equipment. The palletized loading system (PLS) received almost universal praise as a tool that will pay huge dividends for engineers (see photo). One dissenting opinion was concern that having the same PLS transport chassis as the rest of the Army would set up engineers to have their PLS trucks taken by the corps commander to support high-priority logistics missions. It was noted that the reverse is also possible: Engineers could receive assets from other units to help during high-priority engineer missions.

Bosnia Lessons Learned

LTC Mike Biering discussed his 6-month tour in Bosnia as commander of the 62nd Engineer Battalion (Heavy) and provided the following lessons learned:

- The deployment was complicated because the entire battalion is not stationed at the same location (split basing). SIDPERS (Standard Installation/Division Personnel System) reports were submitted to two separate installations for the entire deployment. Unit status reports and METL development should be improved to make it easier for geographically separated parts of a battalion to deploy as one cohesive battalion.
- E-mail systems between supported units and deployed supporting engineer units differ. A solution is to gather information about connectivity prior to deployment.
- Geotextile fabric continues to be extremely valuable for soil and road stabilization purposes.
- The 62nd Engineer Battalion sustained 24-hour operations because traffic and civilian movement were low during night hours. Despite the reduced visibility of working at night, the lack of traffic on the roads made night operations efficient.
- Reuse of materials from decommissioned base camps was a big success and reduced expenses in subsequent projects.
- Daily use and modification of risk assessments keep soldiers safe!

The interchange of information between materiel developers, field users, and Engineer School integrators is critical to providing timely and meaningful support. The results of this session will help maintain engineer effectiveness into the 21st century.

Bridging

By Captain Dan Guilford

The session opened with a brief introduction about the future of bridging. We discussed several doctrinal questions to help guide the development of future systems. The three most important questions were how to order replacement bridges, where to place unused components, and how to account for bridges. We came to a consensus on the first two questions and determined that the third requires further discussion.

The future of bridging incorporates units designed to emplace both fixed and float bridges. These units are no longer tied to their bridges; they can continue forward and maintain the momentum of the maneuver force. The PLS compatible bridge loads make this possible by enabling bridges to become commodities.

Engineers can manage bridges either by the total bridge or by individual loads (flatracks). Everyone agreed that we need the capability to order total bridging for corps and higher elements to provide bridges for the theater. Once in theater, units below corps level need the capability to manage bridges by loads. This capability allows planners to quickly order large quantities of bridges for transport into a theater while providing the flexibility to manage assets to a specific gap.

The group agreed that all components of any load used in construction should remain on site (to include flatracks). The potential exists to waste some assets when a unit uses only a few pieces from a load. However, as we replace those bridges with more permanent structures, units can easily inspect and repalletize the loads if all components are on site. This capability allows units to quickly place loads back into the supply system without an additional logistics burden.

We did not determine how to account for bridges. Whether during war or peace, engineers need an organization that tracks and is accountable for the location of each load and bridge. Units that install bridges will not remain at the bridge sites, and follow-on units probably will replace those bridges with more permanent structures. Units that install bridges lack the capability to maintain accountability.

One suggestion was for the multirole bridge company (MRBC) bridge park to maintain accountability for all bridges in a specified area. It was noted that the MRBC bridge park has limited assets and is not designed for that mission. However, the option exists for the maneuver commander to organize a bridge resupply point (such as a Class IV/V point) from internal assets. Another suggestion is to transfer accountability from the emplacing unit to the engineer headquarters responsible for that area and later task responsibility to the unit designated for main supply route maintenance. As units move, bridging assets would transfer to the replacement units.

The information gathered in this session will greatly assist efforts to palletize existing and future fixed bridges onto flatracks. We will continue to discuss doctrinal questions about bridging assets as they arise.

Countermine Concept

By Lieutenant Colonel Brigid Ockrassa

A diverse group of materiel developers, project managers, combat engineers, Marines, and allied officers gathered for a successful session. Each attendee was given a copy of the draft countermine concept document. Since most of the topics were new, discussion and feedback were minimal. However, attendees were favorably impressed by the scope and depth of the document and will provide comments to assist with the review process. The stated objectives for this session were to—

Explain the new countermine concept and develop advocates to aid in its implemention. The concept was developed by the TRADOC Countermine ICT, which formed in June 1996 to examine countermine issues and propose solutions. In the concept document, issues address the DTLOMS categories and the future operational capabilities of a force operating in a mined environment. The concept document is being staffed throughout TRADOC and is expected to be forwarded to Headquarters, TRADOC, in July.

Obtain input regarding the feasibility and completenss of new ideas in the concept. The participants' biggest concern was resourcing. The countermine concept calls for better equipment, expanded fieldings, increased training, and greater countermine responsibilities. This concern is not new, but it doesn't preclude the ICT from articulating the objective endstate, which is not resource constrained. The Army's ability to achieve that endstate will be influenced by fiscal constraints.

The Canadian representative compared our concept to one they are writing and intends to incorporate many of our ideas in it. The Marine Corps representatives liked the way the concept involves the entire Army and saw potential for this to influence all ground operations. They requested to participate in the countermine ICT and have become active members.

Session participants were given an in-depth presentation on ways to apply risk management to countermine operations, in much the same way that it is applied to aviation. Engineers

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Army program managers. In 1995, an agreement between the Army and the Marine Corps gave the Army the lead as the joint development agency for unmanned ground vehicles. As a result, the Robotic Technology Insertion Activity (R-TIA) was also established at the U.S. Army Engineer Center, Fort Leonard Wood, Missouri.

Insertion Technology

When the U.S. Army deployed to Bosnia in 1995, it encountered more than a million land mines. In response to this, R-TIA and the JPO-UGV developed a prototype remote-control system that could be inserted in turretless M60 tanks outfitted with Israeli tank rollers. The Army built six of these systems, which were named *Panther* (see article on page 21). Their usefulness quickly became apparent as did the need for a standard robotics kit.

In March 1997, the commandant of the U.S. Army Engineer School approved the insertion of teleoperation robotic technology on engineer equipment. The impact is that approximately 20 percent of all dozer-type systems will have teleoperation robotic capability. In addition, other robotic systems, such as an improved prototype Panther on an M1 chassis, have been developed by R-TIA and are being tested (see cover photo).

A robotic soldier assistant, called the Robotic Combat Support System (RCSS), is also being evaluated at R-TIA. RCSS is the ideal small robot for our reduced military force. With RCSS, one person can lift, transport, or do the work of several. This is possible because of its multitask attachments (including a minibucket loader, miniforklift, and hydraulic tool power cell) and its ability to clear mines (such as antipersonnel land mines). An improved prototype RCSS, with a mine flail capability, was sent to Bosnia on 17 June 1997. Older prototypes of the single-use miniflail system have been used in Bosnia since 1996.

User Appraisals

Today, R-TIA is combining a mix of robotic technologies with current and future vehicle platforms and allowing users to evaluate them in the development and preproduction phase. User appraisals allow the combat developer and program manager to get early user feedback from soldiers long before the systems go into production. Thus, problems are fixed before the systems are fully developed.

Fort Leonard Wood is an ideal location for the R-TIA joint service robotics appraisal site due to the presence of engineers from all services. Army, Air Force, Navy Seabee, and Marine Corps engineers have shown great interest in participating in the next round of robotics appraisals beginning 1 October 1997.

Conclusion

The robotic M60 Panther, which was fielded to the Corps of Engineers to clear land mines in Bosnia, is the most successful robotics ground vehicle to date. However, it is only the beginning of new robotic capabilities for combat engineers. Rapid developments in robotics insertion technology allow joint forces to upgrade the existing fleet of equipment for the 21st century at a much lower cost than replacing it. We have learned from Bosnia that inserting robotics technology gives commanders the capability of removing soldiers, sailors, airmen, and marines from the most hazardous missions in both war and host-nation assistance.

Mr. Knichel is the senior Robotics Systems Analyst at R-TIA. A retired combat engineer officer, he has worked with computers, artificial intelligence, and robotics for more than 10 years. Mr. Knichel designed some of the early robotics testing, such as the mine- and booby-trap-hunting ANDROS, deployed to Haiti to support the 10th Mountain Division. Mr. Knichel is a graduate of CGSC and has a master's degree in information systems.

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need tools to quantify the risks associated with mines and various countermine systems for their maneuver commanders. After a thought-provoking discussion, the audience expressed interest in developing an artificial intelligence system.

Conclusion

Breakout sessions are one of many opportunities for the Engineer Regiment to focus on important issues affecting the future engineer force. The 18th Airborne Corps engineers' quarterly video television conferences and the Engineer School's council of colonels provide other opportunities. As we expand our use of interactive media, we must continue to integrate issues into the regiment's strategic plan. The Engineer School's home page is a major conduit of information exchange, but nothing replaces face-to-face interaction and real-life examples. Thanks to all of you who took time to be part of the breakout sessions. Whether you attended the sessions or participate via interactive media, your contributions are valuable.

You can be part of the 1997 conference without leaving home by sending us constructive comments about the breakout sessions described above. Send comments to: Commandant, U.S. Army Engineer School, ATTN: ATSE-TD-TASS, Fort Leonard Wood, Missouri 65473-6650. The e-mail address is: Myerss@wood.army.mil.

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