

**M9 ACE**

**Compactors**

**Dozers**

**The Deuce**

**Cranes**

**Marine Engines**

**Excavators**

**Graders**

**Loaders**

**Airborne Equipment**

**Air Assault Equipment**

**Generators**

**Scrapers**

**Compressors**



# in the mix

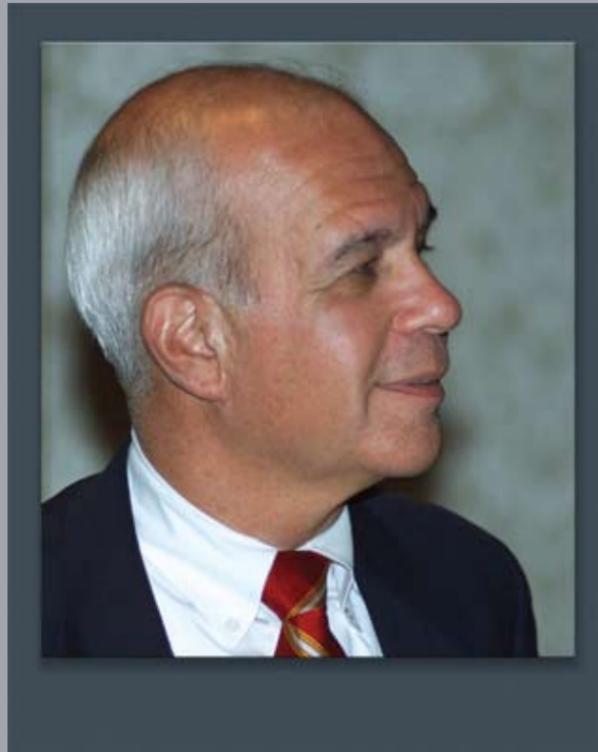
one man's two-decade view of engineer equipment development and acquisition

Sometimes, certain people find themselves at the center of important events, typically for no other reason than they happened to have been there at a certain place and time. This was the case with Mr. Frank Weinberg, who served 40 years at Caterpillar ... with 20 of those years being directly involved in defense products development and acquisition.

Compiled by the Editor of Army Engineer magazine, based on a personal interview with Mr. Frank Weinberg.



**TOP:** Mr. Frank Weinberg. **BOTTOM:** Army Chief of Engineers, LTG Robert B. Flowers presents the Silver Order of the deFleury Medal to Mr. Weinberg during an ENFORCE Conference at Fort Leonard Wood, MO.



**F**rank Weinberg graduated from college in 1966 with a B.S. degree in Electrical Engineering from the New Jersey Institute of Technology. Upon graduation, he was employed by Caterpillar, Inc. in marketing and commercial equipment sales. A year later he was drafted into the Army, and attended Engineer Officer Candidate School at Fort Belvoir, Virginia, where he was commissioned as a Corps of Engineers Second Lieutenant in January, 1968.

Following OCS, he attended Maintenance Officer School at Aberdeen Proving Ground, MD and then served with the 18th Engineer Battalion at Fort Devens, MA. Like many in the Army at the time, he deployed to Vietnam in 1969, and served as the Battalion Maintenance Officer with the 35th Engineer Battalion in the Delta region (IV Corps). He was discharged from the active Army in 1970, but remained in the Army Reserves for a period of time.

He was then re-hired by Caterpillar, and returned to marketing and product development duties until 1986, when he was selected as the Marketing and Contracts Manager for the Defense and Federal Products Division. Later in 1991, he took over that division... serving in the regard until 2006 when he retired.

When asked what specific things about his military service proved to be important to him later in life, he said, "The Army made me grow up—let me see the "bigger" world. For the first time I was exposed to what it was like being in charge of people and things. The Army also gave me opportunities to interact with a wide range of people from different backgrounds, and with different capabilities. And, my time in the Army taught me many things about myself...such as what I could do...all the while giving me greater confidence in my abilities."

He quickly added, "The Army also taught me about the things that equipment can do, and what it can't do. We had to rely on the items of engineer equipment we were given in Vietnam. Sometimes that was OK, but at other times we wished we had been provided with something better."



*The 1980's and 1990's were momentous times for Army engineer Soldiers in many ways. New items of engineer and other equipment entered the force, new headquarters elements and other organizations were formed, detailed branch-specific mission area analyses were written, and the Army as a whole found itself gradually evolving away from traditional Cold War doctrine focused on heavy force-on-force contingency planning, to lighter and less linear operations similar to those being encountered today.*

*What Frank Weinberg saw from his perspective during that period is important to document. His candid and thought provoking opinions remain relevant today.*

**Observations from LTG Daniel R. Schroeder, USA (Retired)**

I was the Engineer School Commandant from June 1988 until June 1991. That was the time frame during which we consolidated the Engineer School and all its functions into Fort Leonard Wood from Fort Belvoir. The first organization constituted at Leonard Wood was the Combat Developments Directorate under the leadership of Colonel Hal Beardslee. Much of our concept development work then focused on battlefield dynamics of the Cold War, fighting large formations and providing the mobility, counter-mobility, sustainment, topographic engineering and general engineering support to those large formations. For those mission areas, there were obviously mixes of commercial and unique military equipment.

The Directorate had a mix of people; some who made the move from Belvoir and some "new hires". It was a time when our thinking was to be aggressive in leveraging relationships with industry, for both commercial and non-commercial needs. That caused a reciprocal reaching out to learn more about each other, and the concepts that drove the Army's requirements.

While some proprietary interests had to be considered, I found both industry and the USAES forthcoming in discussing what was required and what solutions would fit. With our commercial industry partners, the best insights we got were how to improve the acquisition process for the commercial equipment. Some great ideas to remove impediments to logical processes—some we see being practiced today in the rapid acquisition models to field equipment quickly and rationally. I found the other helpful area, one in which industry was more aggressive, was in the area of training developments. Through those relationships we learned how to better train young Soldiers in the use of commercial equipment.

Unfortunately, in the late 80's procurement and acquisition processes were very bureaucratic and did impede the rational acquisition of commercial equipment. Things like data packages, manuals, parts lists etc. that were readily available in industry, but that had to be "militarized" into new documents caused delays and added costs...my sensing is that the same impediments exist today.

My bottom line is that combat developers sharing concepts and ideas with our partners in industry, be it for commercial or unique military equipment, can only help provide improved capabilities in a more timely manner. Unfortunately, manpower constraints and personnel shortfalls have resulted in combat developments being more centralized at higher levels which denies the functional branch focus needed, the establishment of solid relationships and a consistent understanding of branch concepts and requirements.

There is another relationship in this process that needs to be addressed. That is the Material Developer. For the most part, they do good work. However, in the context of acquiring commercial equipment in large numbers for specific organizations, that bureaucracy needs streamlining and standardization for all the services.

It has taken the rapid development initiative processes of the JIEDDO to demonstrate that these procurements can be made in a more timely manner and with less bureaucratic baggage. That is an acquisition reform that gets discussed a lot, but to no avail.



*What follows in this presentation are Frank Weinberg's views, as they pertain to what he observed over twenty years while working within the defense industry. His views are not "company specific" but instead are oriented on the full spectrum of equipment developers and suppliers who engage daily with the Army, to support Soldiers in the best possible manner.*

*His credibility relates to being totally "in the mix" for almost every major item of engineer related equipment in over two decades of professional service. Commercial construction equipment buys including dozers, scrapers, graders, loaders, excavators, earth and asphalt compactors, skid steers and backhoe loaders; the M9 Armored Combat Earthmover (ACE); Airborne/Air Assault equipment (dozer, scraper, grader loader, water distributor); the Deployable Universal Combat Earthmover (Deuce) rubber-tracked dozer for light engineer units; and high output power generators and marine engines for USACE.*

*In addition, the Rebuild and Reset programs as well as the parts Direct Vendor Delivery programs took place during his time in the industry.*

*While the company he worked for did not always receive a contract award for a specific item of equipment on which a bid had been submitted, he was at the center of all facets of the process, and shared many of the same experiences as did his counterparts from competing firms.*



*The relative "rapid" fielding of the Husky vehicle, used to identify mines and other buried explosives, was in large part a result of expedited standard acquisition processes, supported by exigent battlefield needs. Component items were displayed in 2003 at the Army Engineer School. (Photo by FT Eyre)*



## Getting something better isn't easy

In the commercial equipment world, products evolve constantly and are driven by legal requirements and technology improvements. The military tries to take advantage of this, but struggles due to its organization and competing demands for resources—people and equipment, congressional mandates, and the Federal Acquisition Regulations (FAR/DFAR).

The FAR/DFAR regulations are all about eliminating risk for the government and many cannot be waived. The Army is also very "stove-piped" in organization, with many "boxes to check" in relation to fielding a required item of equipment. And, regulations sometimes don't allow the Army's development and acquisition communities to consider the importance of thinking long term or taking risks that might ultimately benefit the Soldier.

All of this produces a situation where there are far more people in the process who can or will say "no", than there are who can or will say "yes".

The Army's equipment development and acquisition processes have not changed much over the years, and have remained relatively bureaucratic and slow compared to what is seen with commercial customers. Compounding this situation is that many in the Army's

equipment acquisition arena have been overly "risk adverse", or could not convince their legal advisors that what they wanted to do made sense.

The speed of getting things done often depended solely on the Army people involved. If one saw, for example, a senior commander who demanded strongly that something be provided to meet the needs of Soldiers under their command, then that action within Army headquarters such as TRADOC and TACOM tended to move quicker. Also, if there was an exigent need for an equipment solution to a specific problem, which affected large numbers of Soldiers, then that too was a driving factor in determining more efficient and timely progress. However, in order for that to occur, standard Army development and acquisition processes often had to be circumvented.

As an Army equipment requirement passed from the developmental side (Engineer School in TRADOC) to the acquisition side (TACOM) there was a need to address much more than just the item of equipment itself. For example, if the item was to be fielded with an "armor package", then that package itself had to be designed, manufactured and validated during testing, along with the base equipment item. Why did the Army not do both in parallel instead of sequentially, in order to speed up fielding?

## Several conundrums

A much greater problem was that the Army required a full set of technical parts and repairs manuals be written, versus allowing industry to modify (with Army criteria) already written and well tested manuals, which are routinely provided along with commercial equipment. The Army placed the same requirement on writing a

set of manuals for an item of equipment not present in the commercial world (an M1 tank for example) as it did for an item that was readily available on the commercial side. That did not make sense within industry, wasted money and delayed fielding. Why not take advantage of the information already available?

These sorts of issues resulted in it usually taking approximately six months after release of a Request for Proposal (RFP) to contract award, and then an additional two-plus years, before the item of equipment could be actually fielded.

Also, the Army's RFP process as it has existed over the years seemed to overly focus on initial price versus giving more weight to the total life cost and "added benefits" which might be offered by a bidding company, whose proposal might have a higher initial price than the others. Even though the total contract price was higher than the others, it was (overall) a better long term value.

Lastly, the Army could have done a better job getting the "user community" involved in the source selection process. The Army's acquisition personnel generally have little if any "field" experience, and as such may not be able to judge "trade-offs" during the evaluation process. Perhaps it would have been better if currently serving military personnel could have been included in the effort, so as to insert "ground truth" into the decision process, as they are in USACE bid evaluations. Gaining that capability was admittedly hard to do in the past, and it is certainly worse in today's military environment.



A major impediment to more efficient equipment development and acquisition progress within the Army pertained to military and civilian personnel sometimes failing to appropriately nurture professional relations between themselves and industry.

Some were hesitant to engage with representatives from industry during the process because they feared potential violations of ethics rules, or sometimes they did not have the funds to support TDY travel to industry locations. Others were overly concerned with fair-

## Fear of ethical violations

ness and believed they had to work with all companies who **might** be interested in developing a specific item of equipment, rather than working with the few who actively had the capability to produce the item. The result in too many cases was an uninformed buyer!

Additionally, too often the output of the process was a less than desirably written "requirements package", which described what the Army needed and was as such a generic RFP, being given to firms who desired to submit a proposal. Had there been a greater level of interaction early on between those in the Army and those in industry, pertaining to **specific** functional capabilities desired by the Army versus what was available, industry would have been able to prepare a better proposal, thus resulting in equipment which would better satisfy the actual need of Soldiers.

The **Wolverine** heavy assault bridge was in development for many years, and was designed in part to replace the 1960's era Armored Vehicular Assault Bridge (AVLB). The vehicle is shown here on display at the Engineer School in 2003. (Photo by FT Eyre)



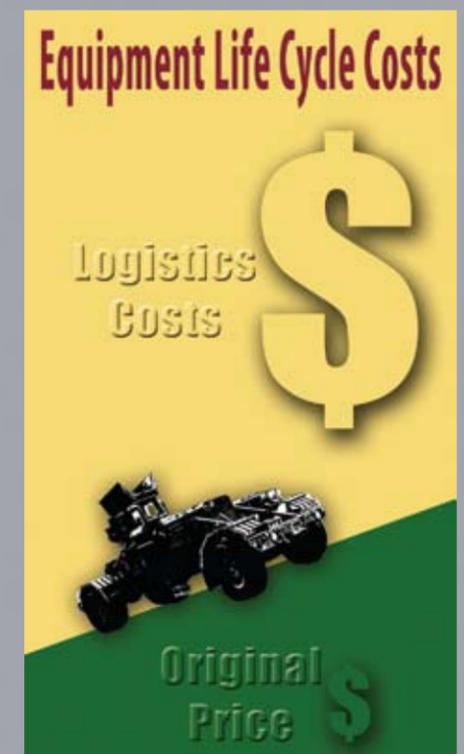
An armored, multi-purpose assault breacher type vehicle has been in development for years, but to date such a capability has yet to be fielded. One reason for this has been a lack of adequate Army-wide support for the item. A prototype was on display at the Engineer School in 2003. (Photo by FT Eyre)

## What about Life Cycle Costs?

The Army has made some improvement over the years, in paying greater attention to the total life cycle costs for an item of equipment. However, much work needs to be done to make it better.

For example, if one looks at the typical life cycle cost of an item of engineer equipment in the Army during recent years, only one-quarter of that pertained to the initial price as provided by the manufacturer. The remainder involved fuel costs, repair parts costs, maintenance and so forth.

The Army has tended to overly focus on the initial price, and not enough on down-stream costs, which admittedly are difficult to quantify. Thus, the Army often has downplayed those latter costs, resulting in strained budgets in following budget years.





**TOP:** Caterpillar, Inc. displayed their new D7RII during the 2008 ENFORCE Conference in St. Louis. The machine is based on a commercially available item of equipment, militarized to meet the needs of Soldiers. **BOTTOM:** A Bobcat on display at the Engineer School as it was being introduced into the Army's equipment inventory. Like the D7RII, it is also available in the commercial market. (Top photo by Michael Morgan, bottom by FT Eyre)



There is a wide range of commercially available engineer construction and other equipment available for lease...both to troop units and other organizations such as those in the installation public works field. (Photo by FT Eyre)

## Should you lease what you need?

Some may not know that the Engineer Regiment has in fact leased equipment for many years. Commercial rates were used, as well as standard commercial leasing requirements such as if an item was damaged, then the user owned it. Options to buy were also exercised in some cases. Training and parts/service support was provided by the contractor for the equipment.

Leasing seems to be a viable course of action for the Army in the future; however, the more an equipment requirement is militarized, the greater the lease cost and the greater the time to make the item available. Even with those constraints, leasing is a much faster way to satisfy an equipment need, compared to the standard development and acquisition process in use today and in the past. Additionally, leasing can be applied equally effectively in peacetime as it can during war, when there is a greater sense of urgency involved.

One consideration pertaining to the Engineer Regiment in a stateside environment, would be to lease smaller and lower cost commercial construction equipment for student use on the Engineer School's field training areas. Could not, for example, an entry level dozer operator learn to operate a machine using a small commercial D4 versus a militarized D7? The same analogy would apply to just about any item of construction equipment in the Army's inventory, given that a similar commercial version of the item is available.

If the Army couples that way of thinking with greater use of military-scenario simulators during training, the skill of the operator upon graduation should easily meet military standards.

Public works personnel on military installations might also execute lease agreements for their needs, and could engage in short term rentals of specialized equipment, such as is done throughout the commercial construction industry today.



## Speak with one voice and you will have a better chance of being heard

Engineer equipment requirements often have not received sufficient Army-wide support, and thus failed to gain eventual funding. Those items which did gain a wider range of support were jointly “worked” through TRADOC and Headquarters Department of the Army, jointly by the Engineer School and the Army Chief of Engineers in the Pentagon—all “speaking with one voice” for the Engineer Regiment.

When the Engineer Regiment presented a united front, and those same needs were being heard from combat commanders in the field, who were being well advised by their subordinate engineer commanders, then funding often became available and industry could respond with appropriate support.

*Soldiers of the 94th Engineer Battalion (shown here) and many more serving with other engineer troop units serving in Iraq, saw a need for a special item of engineer equipment such as the commercially available heavy D9 dozer. Senior engineer leaders all “spoke with one voice” to the Army, and their needs were made known through the equipment acquisition process. The result was the fielding of a militarized, armored protected version of the D9, around which the pictured Soldiers assembled to say “thanks”. (U.S. Army photo)*



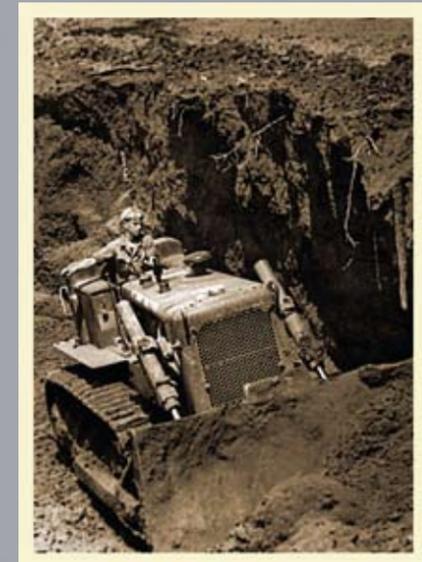
## Look to the future, but don't forget the past

Back in the late 1990s there was much discussion within industry and the Army concerning whether or not to provide armor protection on some items of engineer equipment...dozers and loaders for example. However, the Army did not adopt those criteria then because too few key personnel outside the engineer branch in the decision process believed that adding additional armor to engineer equipment would justify increased developmental costs. What has been seen thus far in Afghanistan and Iraq clearly shows that was a major oversight.

Over the years the construction equipment industry has seen an evolution in the mechanical operation of its items of equipment. During Vietnam, for instance, Army Engineer scraper operators made cuts and fills utilizing cable-controlled devices. Later, that changed to hydraulic controls. Today, the Army is moving to low effort “joy stick” controls, all following the lead of the commercial construction industry.

These type trends result in equipment operators, both military and civilian, being able to perform their jobs more efficiently, over a longer period of time, with less physical effort than before.

The Army should thus remember its equipment development past while looking ahead to the future, utilizing both military and commercial research and developmental programs, so as to be able to take advantage of all sorts of technology advancements.



*An Army engineer operating a dozer during the war in Vietnam. (U.S. Army photo)*

## The road ahead

Fortunately, senior engineer leaders in the Army today are working toward **Building Great Engineers**—in troop units, in the school house, in USACE districts, and in USACE laboratories. Steps are being taken to seek improvement in many of the bureaucratic processes discussed above. For instance, an excellent cooperative and partnering approach exists today between those in the Engineer School and those from industry who work hard to provide quality products and services to the Army. More importantly, the dynamic needs of the Global War on Terror have combined to identify many of the overly bureaucratic processes used in the past, all the while demonstrating numerous successes toward getting things accomplished in a more timely manner.

While major challenges for the Army remain to improve its overall equipment development and acquisition system, the working environment is changing. Perhaps soon what were impediments to efficient equipment development and timely acquisition in the past, will be no more. **AE**

*While this presentation was compiled by the Editor of Army Engineer magazine, it was based on a one-on-one interview, and all thoughts and opinions included therein are based solely on Frank Weinberg's personal experiences as expressed during that session. As such, it provides for those interested, an excellent historical perspective of Army engineer equipment development and acquisition.*