TRAINING SYSTEMS: THE CRITICAL ADVANTAGE FOR THE ARMY RESERVE COMPONENTS

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ABSTRACT

Since the advent of the Total Force policy, the Army Reserve Components (Army National Guard and U.S. Army Reserve) have become a prime potential beneficiary of current and future technology applied to training. The Total Force policy has significantly reduced the mobilization time for the Reserve Components while placing those forces in a combat environment of rapidly increasing intensity. These conditions have converted the Reserve Components from a reserve army to an army in reserve. In spite of the similarity in mission between the Active Component and the Reserve Components, the Reserve Component training environment little resembles that of the Active Component and is little understood by the Active Component or industry. The Reserve Components' widely dispersed and constrained in training time, terrain, facilities, and equipment. Technology offers the potential to overcome many of these training difficulties. However, for the Reserve Components to benefit from technological potential, both the Active Component proponents and industry must *educate themselves* about the uniqueness of the Reserve Component training environment and commit to new development and marketing strategies.

INTRODUCTION

Since the advent of the Total Force Policy in 1971, Reserve Component training requirements have increased in number, complexity, and intensity. The Total Force Policy has resulted in Army National Guard (ARNG) and U.S. Army Reserve Component units with similar missions. In addition, technological advances in warfare have increased the intensity of warfare and world politics have *significantly* reduced the available time to mobilize. For example, the Arab-Israeli was of 1973, experienced levels of conventional destructiveness previously only associated with nuclear warfare and improvements in weapons system mobility, speed range, and lethality has moved inexorably forward. Over 75% of ARNG units must now mobilize within 60 days of notification, compared with over 120 days only a few short years ago.

A recent Army Training Board (1987) study stated that while optimizing the effect of training is the goal of every Army unit, nowhere is the mandate to do so, or the consequence of failing, more evident that in our reserve forces. The capacity of Reserve Component units to recover from even minor false starts, disconnects, and interruptions is limited by the absence of most of the inherent training flexibility available to the Active Component. Almost everything about the Reserve Component training environment is at least somewhat, and often significantly different from that of the Active Component. While the similarities between the two parts of the Total Force are important, it is the differences and their ramifications which are critical to optimizing training. The fundamental nature of the Reserve Component training environment is set by a number of truths subject to minor modification, but not to substantial change.

In this paper, I hope to identify some of these key differences and the ramifications for Reserve Component training and suggest ways in which technology can be applied to this environment.

THE RESERVE COMPONENT TRAINING ENVIRONMENT

The transfer of missions and increasingly sophisticated equipment to the Reserve Components has resulted in an increase in the absolute number of tasks to be learned and an increase in the level of proficiency with which these tasks bust be practiced. This overall training requirement is exacerbated by reorganizations, unit level turbulence, geographical dispersion, competing requirement, and time constraints. So far, these words would probably bring nods of recognition from any Active Component trainer and generate a "so what"? What makes the Reserve Component environment unique is the constraints within which these factors must be dealt and the ways in which these factors interact. The remainder of this section expands upon some of these points.

According to the Army Training Board (1987), approximately 20% of the Reserve Components were reorganized in FY 86. During the same year; unit level turbulence at E5 level and below was 37.5% for the ARNG and 48.7% for the USAR. When this shifting array of tasks and training audience are combined with the effects of geographical dispersion, time constraints, and facility constraints, one can begin to appreciate the differences between Reserve Components and Active Component.

According to the Institute for Defense Analysis (1987), the Reserve Components have 6900 battalions or separate companies/platoons at 3956 armories/reserve centers throughout the United States (ARNG has 3457 units in 2858 armories and the USAR has 3438 units in 1098 reserve centers. The average population of an ARNG armory is 148 and the average population of a USAR center is 202. These numbers do not necessarily mean that the total population of an armory or center belong to the same unit. It is not unusual for a company to be split between two or more armories. According to the Army Training Board (1987), the average battalion is dispersed over a radius of 150 miles with some extending over 300 miles. Division equivalent

headquarters rarely have all of their subordinate commands in one state and may extend over as many as 12 states. Units (read battalion/separate company) have to travel an average of 128.5 miles to get to their major equipment (e.g., tanks), 40.1 miles to a local training area, 154.2 miles to a major training area, and 149.2 miles to a training support center. Since these are averages, actual distances for any given unit can vary greatly, The training implication, if not already apparent, will be discussed later.

When considering training individuals in job skills, the task is magnified. Many individuals travel several hundred miles one-way to weekend training with some travelling up to 500 miles. Further, there is a low density of any given military specialty at any given armory/training center and even fewer experienced instructors. About 75% of the Reserve Component force needs some type of skill training (e.g., MOS or professional development). The Institute for Defense Analysis (1987) analyzed occupational specialties by site. They found that 13 of the 32 (41%) career management fields accounted for 33-50% of the Reserve Components. Table 1 and 2 show a representative comparison of Reserve Component skill densities per site with the Active Component for the most densely populated specialties in the Reserve Components. As you can see, the Reserve Component commander has a diverse training challenge to maintaining individual proficiency or to do skill conversion training due to reorganization or individual reassignment.

Modern weapon systems mobility, range and lethality have rendered many of the Reserve Component training areas and ranges obsolete because they require an increased amount of land for maneuver space and ranges to conduct realistic training. Adding to the land base is difficult and expensive. In some cases, the land is simply not available in the quantities needed. For example, in Iowa, less than 3% of the land is federally held and little more is state held. To add to the training land base would mean converting privately held lands. In other cases, environmental concerns make it difficult to add training lands. The net result is that units must travel greater distances to conduct realistic full scale firing and maneuver exercises.

Additionally, many units, particularly combat support and combat service support units do not have the equipment available that they would support in combat (e.g., M-1 tank maintenance units and hospital units).

To summarize all of these numbers in another way, imagine a force slightly larger than the Active Army distributed throughout the United States in mini-installations that vary in size of between 148 and 202 soldiers, very much like *kasernes in Germany*. *Further imagine* that the bulk of your equipment and training areas are one and a half hours away and that you have 10% of the potential time to train per month as an active unit during most of the year (50% during annual training). Of that 10%, the Army Training Board (1987) reports that unit commanders estimate that they can spend about one-third of their available weekends (for weekends), and about one-half (one week), of their annual training.

Of course, all of these requirements are accompanied by a concomitant increase in the number and variety of administrative tasks which must be performed by units. In fact, 71% of the unit commanders in the Army Training Board study (1987) identified some form of administration as their "real" number on priority. Less than 50% listed training among their top three "real" priorities.

The net result is that the company commander's plate is too full and complex. In addition to the increasing number and complexity of the tasks to be performed, there are physical, demographic, and time factors which constrain using the options used by the Active Component. These conditions have already impacted training effectiveness. According to the Army Training Board (1987), 62% of the company commanders report that they do not have the time to personally supervise training. They estimate that they can perform about 50% of their Army Training and Evaluation Program tasks and can sustain about 60% of the individual skills prescribed in the Soldier's Manual. To put in Active Component terms, one Reserve Component training day is the equivalent of five days for the Active Component. That means that when we force a Reserve Component unit to travel 1-1/2 hours one-way to obtain training aids or 2 hours to a local training area that is the same as forcing an Active Component unit to travel 7.5 hours to get training aids, or 10 hours for local training each way. These expectations would usually be considered intolerable in the Active force which has more time available.

All of the discussion to this point sounds pretty bleak only because it focuses on an objective status and how to do the training job better. If one were to compare the training situation in the Reserve Component forces now with as little as five years ago, tremendous progress has been made. The nature of the modern battlefield, however will not allow us to look back, but forces us to look forward. We simply must improve Reserve Component levels of performance, and we must do it within the "fundamental truths: that are not amenable to substantial change.

As a total force, we must restrict the missions to the Reserve Component units to those that are most likely to be encountered and/or are most critical to war plans and stabilize those missions over time. We need to develop training multipliers, ways to improve the leverage of the training opportunities that do exist. This requires more than a modification of the way we now do business, it requires a fundamental reorientation in the training device development and procurement arena. It requires developing training devices, simulations, and training strategies specifically based upon an analysis of Reserve Component mission tasks and environment.

RESERVE COMPONENT TRAINING DEVICE, SIMULATION, AND COURSEWARE REQUIREMENTS CHARACTERISTICS

Technology can help the Reserve Components overcome some of the training hurdles faced. In this section, I point out some of the general considerations and some of the physical and functional characteristics needed for training devices, simulations, and courseware designed for the Reserve Components.

Some of the general considerations for training in the Reserve Component environment are:

a. Take the training to the troops, it is generally unacceptable to take troops to the training, travel time is predominantly wasted time. Ideally, individual training would be moved to the soldier's home and low level collective training would be conducted at the armory/local training area. Field opportunities should provide for the most realistic training possible at the highest level of organization that the terrain will support.

b. Bring the outside in. That is, bring the field into the armory or home. The extent possible, embed training in realistic scenarios which allow for escape, slow down, or replay for remediation. There is insufficient time to routinely conduct training in linear steps, some training must occur by "osmosis" and build intuition or "field smarts" by operating in the actual environment or high fidelity surrogate environment.

c. Training devices, etc., do not replace field training, we must still go to the field, but we must make those rare field opportunities more productive. We must reduce the use of troops as training aids, individual/leader skills must be learned to the extent possible before going to the field.

Some of the specific desirable physical characteristics are:

a. Portability. Devices, simulations, and courseware must at a minimum be deliverable in the armory/training center. Ideally, devices could be taken to annual training with the unit and significant portions of individually oriented training would be transportable to the soldier;s home. Devices must be able to be put away when not in use. Armories/training centers typically do not have enough space to permit permanent fixtures, space must be multipurpose.

b. Reliability. Device use is characterized by infrequent, but intense use by a wide variety of users with widely varying levels of skill. Hence, shipping containers must be rugged, devices must have handles and grips that permit easy movement, and must be very forgiving to environmental variance (e.g., outside devices will be subject to dust, temperature extremes, and humidity).

c. Inexpensive. When one considers that there are 4000 training sites, the feasibility of a solution must be sensitive to costs. For example, for trainers designed to be issued on per armory/training center, I would consider about $100,000 per device to be the ceiling cost to remain viable. For devices designed to be workstations or signed out to individuals to be used at home, $10,000 is probably about the ceiling. These are procurement cost estimates and are not absolutes, but are intuitive estimates based upon experience over the last year. The lower the cost, the higher the probability of acceptance.

d. Computer based devices should use EIDS to the maximum extent possible.

Some functional considerations include:

a. Armory training should be scenario based with escapes and slow downs/replays for remediation. As previously mentioned, time does not permit a purely linear learning strategy.

b. Trainers and courseware should be interactive. The training should respond to the actions of the trainee/crew and show the consequences of their actions.

c. Scenarios should be realistic. The feedback should reflect realistic odds of success, that is the "correct" decision in combat scenarios do not always work, it just improves the odds of success.

d. Scenarios should provide for variety. Reserve Component soldiers may move among units, but at least in the ARNG they tend to stay in the service. Soldiers rapidly learn the "rules of the game" and stop using devices when they become repetitive. New scenarios and more complex scenarios need to be routinely developed. The devices must accommodate a wide range of skill levels from expert to remedial.

e. Devices must require little or no training to operate. There is little time to perform mission training now, there is no time for learning to use devices. Likewise, devices should not require dedicated instructor/operators. They must be user friendly with built-in tutorials. As a guideline, the maximum time to learn how to use a device should not exceed a four hour drill period.

f. Devices need to be designed for use at local training areas (e.g., MILES) that permit realistic field training to be conducted over reduced acreage. Ideally, field devices should permit interplay of direct fires, indirect fires, and air support. Devices should require minimum installation and tear-down time.

These general parameters should give both proponents and contractors some idea about how to develop technologically based items applicable to the Reserve Component environment. Some current and past examples of technological applications to this environment are:

a. PM-TRADE is developing GUARDFIST-I and II which uses videodisk technology and EIDS to train artillery forward observers and tank crews in procedural skills in the armory using combat scenarios. GUARDFIST-I will strap on to a tank, use all of the tank controls, and involve the entire crew in video scenarios. GUARDFIST-II will allow a forward observer to practice calling fire missions by interfacing with the device in the stand alone mode or exercise the entire fire support team.

b. The Training Technology Field Activity-Gowen Field is working on two individual computer based courses. On involves conducting the Armor Basic NCO Course (BNCOC) using lap to take home computers, EIDS, and teleconferencing through USAR schools. The second project involves using computer based combat scenarios to teach tactical employment and planning skills to armor leaders at company level and below before going to the field. It amounts to a tactical exercise without troops or terrain,

c. The Army Research Institute is completing testing the use of computer based instruction as a surrogate for maintenance personnel who do not have access to end items during drill weekends.

d. The National Guard Bureau has funded initiatives for testing or developing devices amenable to armory training for the TOW and Dragon weapons systems, short range air defense weapons, and infantry squad employment. Additionally, NGB has funded additional MILES equipment for the Reserve Components and purchased devices for Regional Training Centers for Maintenance using Congressionally dedicated funds for such purposes.

The most promising technologies currently appear to be:

a. Interactive video for simulation and instructional courseware. Videodisk and various versions of CD/ROM appear applicable.

b. Ineractive courseware is a critical need in the Reserve Components. Well designed interactive courseware that encompasses most of, or complete courses are needed (e.g., NCO and officer professional development courses and MOS qualification courses).

c. Telecommunications applications that permit delivery to remote sites.

d. Surrogates for live firing in both armory and field settings such as the precision gunnery training (PGS) devices being developed by PM-TRADE for tank and Bradley training.

e. Micro-command Post Exercises where newly appointed battle staff members can practice their skills by interacting with the computer which will play the other staff officers, scenario, and provide evaluation and seminar capabilities.

STRATEGIES FOR ACTION

Reserve Component training device needs do not currently compete very successfully for either attention or funding. Nearly all Reserve Component unique new starts have been initiated through Congressionally dedicated funds for that purpose. Actions by both the military and industrial establishment can affect change in this regard. It is time to make these adjustments. As of 1987, the Reserve Components are the majority of the Total Force (52%). Further, the difference between first to fight and last to fight is becoming less significant. That difference for the ARNG for example, amounts to about 60 days.

Since there will never be enough resources to meet the continuing needs of the Active Component, placing the Reserve Component needs after the Active Component means that no significant progress will be made in the Reserve Component arena. Approaching Reserve Component training as a postscript or extension to Active Component training strategies will not result in satisfactory solutions. It is time to recognize that Army doctrine will not change American culture not the fundamental environment in which the Reserve Component soldier must operate. I recommend that the active establishment consider taking the following actions:

a. Dedicate TRADOC resources to working exclusively in the Reserve Component environment. These resources would be dedicated and not be able to be bumped by "higher" priority Active Component tasks. These resources should include research and development, training developers, procurement funds, and combat developers.

b. Fence a proportion of the Nonsystems Training Devices budget dedicated to Reserve Components. These funds would be used like the Congressionally dedicated funds of FY 86 and FY 87.

c. Dedicate a portion of exploratory research to further define the differences between Reserve Component and Active Component training. Develop approaches to address these differences.

d. Redefine the concept of "cost effective" for the training devices for the Reserve Components. The dominant current concept is the amount of use for the device per dollar (e.g., hours per dollar). Cost effectiveness should be the extent to which the device contributes to increased training readiness of the using unit. Effectiveness is not efficiency.

The current system does not sufficiently recognize a Reserve Component unique environment and results in devices that are centralized, expensive, and carry high overhead. The alternative is for the Reserve Components to continue to appeal to Congress through their respective associations for dedicated funds,

which inevitable are removed from defense line and given to the Reserve Components by Congress. This would appear to be less desirable that developing programs that the Reserve Components and their associations can fully support.

Industry can also be helpful in this arena. As you can see, the Reserve Components make up a considerable market that exists in nearly all Congressional districts. Recognizing Reserve Component implications when making proposals can help sensitize the whole system. Your military consultants need to be sensitive to the differences and as they move through the Pentagon and other halls of influence to begin to sell the Reserve Component side of the Total Force. Frequently your interests can be coordinated with ours and moved through more avenues of action than the bureaucracy alone.

SUMMARY

The Reserve Components represent a unique training environment. It is characterized by wide geographical dispersion, low training densities at any one location, compressed training time, lack of equipment, and frequently undersized facilities. The elements that make this environment unique are not amenable to substantial change. Technology can contribute to mitigating the effects of this environment through the development of devices and simulations that expand the number of training opportunities (e.g., practices per hour), increase the realism of training, are portable (takes training to the troops), require low overhead (e.g., dedicated operators, time to learn to operate), are interactive (e.g., provides feedback and remediation), and are inexpensive.

The Reserve Component training needs must be addressed as a unique environment by both Active Component and industry. The Reserve Components represent over half of the force and a sizable market. This market can be penetrated through the actions to the Active Component proponents, political actions of the associations interested in Reserve Component readiness, and/or industrial marketing strategies.

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