THE SYNERGISM OF USAREUR'S TOTAL TRAINING SYSTEM

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ABSTRACT

USAREUR has increased its training effectiveness by maximizing the use of the latest training technologies. Its unique training strategy to maintain readiness for diverse and changing missions is described. A combination of live, virtual and constructive training resources are used at all echelons for individual, collective and leader training. The application of training resources individually or combined and integrated by means of Distributed Interactive Simulation (DIS) to create realistic/ seamless brigade, corps and multinational training is outlined. The techniques used to assess training and leverage its value through feedback are discussed. By these means, training resources have been cascaded resulting in synergisms that provide higher levels of training effectiveness at substantial cost savings.

ABOUT THE AUTHORS

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INTRODUCTION

The scope of USAREUR training extends from developing the individual soldier skills to leadership skills of the general officers at Corps, Joint Task Force (JTF) and Multi-National levels. It encompasses weapons handling to multi-national command and control. This training has been compounded by new mission requirements, e.g., Operations Other Than War (OOTW).

USAREUR has met this challenge, despite declining resources, with a creative mix of live training, simulators and simulations. Training is multi faceted and tools are applied successively and in combination providing a tailorable progression that results in a high level of proficiency across every unit's Mission Essential Task List (METL). The integration of training resources through the application of Distributed Interactive Simulation (DIS) technologies was demonstrated during Synthetic Theater of War - Europe (STOW-E). Culmination exercises such as Atlantic Resolve (AR) are structured at the Corps and Multi-National level. These exercises capitalize on the latest technologies across the spectrum of tools and net-working capabilities. In this manner, the greatest level of fidelity and degree of detail necessary, as determined by the objectives of the exercise, are achieved at least cost.

USAREUR's return on training resources has been significantly leveraged and combat readiness multiplied, by applying today's tools to maintain readiness in an environment of varied and changing missions. This paper describes USAREUR's comprehensive and multi-dimensional training strategy, which is at the cutting edge of training technology. STOW-E and Atlantic Resolve are also USAREUR unique training events.

TRAINING SYSTEM OVERVIEW

The training of Combat and associated Combat Support and Combat Service Support units is one of USAREUR's primary missions as the Army Component and force provider within U.S. EUCOM. Training is conducted at every echelon from the individual/crew level to the platoon, company, battalion, brigade, division and corps. Training at all levels is focused on the METL. These tasks increase in their scope and complexity as the echelon level increases. At the division level they may be defined as: Move the Division; Conduct Offensive Operations; Conduct Defensive Operations; Regenerate Combat Power

Each mission essential task depends upon one or more Battlefield Operating Systems (BOS) for their accomplishment. The BOS are: Maneuver; Fire Support; Battle Command; Air Defense; Intelligence; Combat Service Support; and Mobility/ Counter Mobility/Survivability.

Each of these BOS are comprised of multiple functions and tasks that are required for their implementation. Maneuver, for example, may require preparation and supplying of vehicles, navigation within the battle space, and application of fire power to overcome the enemy. Depending upon the type of unit and echelon, the training occurs to varying degrees at home station;

Grafenwoehr, USAREUR's only major live fire training area; and at the Combat Maneuver Training Command (CMTC), USAREUR's only maneuver training area for Company/Team and larger units. Local training areas and maneuver rights areas have been severely reduced.

The mission essential tasks and the application of their required BOS are trained through the accomplishment of live training and a combination of training aids, devices, simulators and simulations (TADSS). These techniques are used collectively and in varying combinations at each echelon level.

LIVE TRAINING

Live training is conducted for the individual/crew utilizing dry fire techniques and a variety of simulators and sub-caliber devices at home station. Marksmanship is enhanced with the Multipurpose Arcade Combat Simulator (MACS), Weaponeer Rifle Marksmanship trainer and preliminary marksmanship instruction focusing on small arms. The focus of home station or LTA training is "hands-on" experience with weapons.

Gunnery and crew validation/qualification are a major part of the semiannual rotations to Grafenwoehr. Grafenwoehr has the capability to support small arms and all major caliber gunnery including multiple launch rocket systems and attack aircraft. The crew and unit conduct live fire during a series of progressively more difficult firing tables. Final validation of training occurs on the ranges for Table VIII and XII.

CMTC is where the training strategy comes together. It allows a battalion to maneuver on a realistic battlefield with an adjacent unit portrayed in simulation. It is the only place in USAREUR where a Task Force (TF) commander can maneuver his entire unit in a realistic field exercise against a live Opposing Force (OPFOR). CMTC incorporates a fully replicated German town for use in the conduct of Military Operations in Urban Terrain (MOUT) as required by a unit's METL. CMTC allows training of all BOS elements and key tasks while maximizing scarce maneuver time on the instrumented battlefield.

VIRTUAL TRAINING

Simulators, virtual training, are used primarily at the platoon and company level allowing for practice and assessment of fire, maneuver and command and control skills prior to commitment of maneuver space and time at CMTC. The primary TADSS are the Unit Conduct of Fire Trainer (UCOFT), the Platoon Gunnery Trainer (PGT) and Simulation Networking (SIMNET). These simulators permit crews and platoons to develop their individual and collective skills in fire control and maneuver prior to live fire or maneuver training.

A crew must demonstrate UCOFT proficiency prior to live crew qualification gunnery. UCOFT training is conducted at home station. Platoons must show proficiency in the PGT and SIMNET prior to conducting live Table XII at Grafenwoehr and moving on to maneuver at CMTC. This demonstration of gunnery and maneuver skills is conducted twice annually at Grafenwoehr. The major simulators are:

UCOFT: The UCOFT is a high resolution precision gunnery trainer consisting of either tank or Bradley commander and gunner stations. It provides training in target acquisition and engagement with the Abram's tank main gun, .50 caliber machine gun, and coax machine gun, and Bradley M2/M3 TOW missile system. The stations are exact replicas of the actual vehicle interior. An instructor station allows a controller to monitor and assess the actions of the vehicle commander and gunner.

PGT: The PGT allows platoon leaders and company commanders to train their subordinate units or crews on tactics, communications, fire control and distribution techniques and precision gunnery. It is a high resolution trainer that utilizes visual and acoustical effects to simulate a realistic battlefield environment for M1A1 tank and M2/M3 Bradley crews. An instructor operator controls, monitors and assesses the exercise.

SIMNET: The SIMNET consists of a series of combat vehicle simulators configured to provide realistic training for fully manned platoon, company and battalion level armored and infantry units to fight engagements against an opposing semi-automated force (SAF). The training is in real-time and interactive on a virtual battlefield providing the capability to train collective tasks in battle command, communications, maneuver and fire support on a free play scenario. It is limited in it's training in the areas of intelligence, combat service support and air defense due to lack of realistic user interface for these BOS. It is used by commanders as an alternative to, or in preparation for, field training exercises and as a final exercise prior to a CMTC maneuver rotation.

CONSTRUCTIVE TRAINING

Simulation models, constructive training, are used primarily at the battalion and higher levels as Command Post Exercise (CPX) drivers. Constructive simulations have proven their capability to support such exercises. These models support command and control training of the Tactical Operations Centers (TOCs) and focus on exercising the commander's skills in employment of the BOSs. Commanders and staffs of the training audience exercise in real war like environments and are filtered from the computer driven battle by controllers inserted at various levels. The controller/players role is to represent the lower level commanders and staffs to the training audience while executing the orders of that audience within the simulation. Three basic models are used. These models and their associated echelon levels are: BBS/BFT for the Battalion, BBS for the Brigade and CBS for the Division and Corps.

The goal of these simulation models is to develop the commanders' and staff's skill in Battle Command and the other combat functions of maneuver, intelligence, fire support, mobility/survivability, air defense, and logistics. Appropriate tools (simulations) are incorporated into the exercise architecture to provide the level of detail desired based on the objectives of the exercise.

All major elements and processes associated with the commander's decisions are represented through simulation. The consequences of the commander's decisions are further determined by the actions of subordinates to develop further orders and to pass the commander's intent correctly to the lowest level of participant. The models are at the end of the chain and utilize approved algorithms in the determination of specific battle outcomes. By this means, the commander's decision making skills are exercised in real time without the costly need to use real soldiers and resources. The subsequent After Action Review (AAR) Process permits the conduct of seminars for the consolidation of learning insights and experiences. Key constructive models are:

Battle Focus Trainer (BFT): Located at each major maneuver brigade headquarters, this model is designed to allow units an opportunity to demonstrate gunnery and maneuver proficiency prior to a live exercise. USAREUR utilizes The Urban Combat Computer Assisted (UCCATS) as its BFT model. UCCATS is a high resolution interactive simulation that supports a company or battalion commander's maneuver training objectives. It

emphasizes the BOS in maneuver, command, control and communications. It portrays maneuver in real-time and has a flexible configuration that supports home station exercises. It is also used to train company level troop leading procedures and to reinforce company commander/platoon leader battle focus skills. It can further be used to train squad leader/TC tactical skills. Rural and urban combat exercises can be practiced.

Battalion/Brigade Simulation (BBS): BBS is used to train brigade/battalion commanders and their staffs on the integration of the Battlefield Operating Systems. It is Located at CMTC and all major maneuver command headquarters. BBS stresses battle command, intelligence, and logistic operations. It requires key unit personnel as tactical role players. As an aggregate level simulation, company commanders fight their platoons. BBS is limited in the maneuver of individual entities such as engineer and air defense assets that may be attached to a unit. It is effective, however, in training command and control, intelligence and combat service support operations. Each battalion staff experiences a BBS exercise annually at CMTC, in conjunction with a live task force exercise.

Corps Battle Simulation (CBS): CBS is a hex based terrain computerized CPX driver designed to aid in training Brigade, Division and Corps commanders and staffs. CBS models a broad variety of unit types and sizes ranging from individual Air Defense weapons to small special forces units that can be inserted by helicopter to conventional units such as battalions and brigades. The functionality of the model has been accepted by the Army as the Service standard. During a CPX, a training audience in field tactical operations centers and command posts interacts with exercise controllers in Battle Simulation centers. The controllers, working in response cells, provide an interface between the training audience and the model. These controllers represent subordinate commanders and staffs to the training audience, imputing orders to the model and filtering and formatting battle outcome information to be relayed. The model supports training of command and control and staff procedures, portraying all of the Army's BOS. CBS is utilized to drive all USAREUR Division and above exercises.

The Confederation of Models, a combination of all Service standard models consist primarily of CBS, Air Warfare Simulation (AWSIM), Research, Evaluation and System Analysis (RESA), and Tactical Simulator (TACSIM). AWSIM is the Air Force standard model which models air warfare at the level of individual aircraft conducting air-to-air, air-to-ground, and SAM engagements. RESA is the Navy standard model which models naval air, surface and subsurface warfare at the individual plane and ship level. TACSIM provides the national level intelligence assets to supplement that intelligence provided by the other models or the actual exercise audience.

The confederation interface is the Aggregate Level Simulation Protocol (ALSP) which acts as the controller and information carrier for the primary models. ALSP's two primary purposes are to insure that other models know of actions that affect them, such as air attack on a tank company, and to control time so that all models run at the same rate and display similar times, models run at the rate of the slowest model which is generally fast enough to maintain real time representation.

BATTALION TRAINING STRATEGY

A battalion goes through continuous sustainment training at the squad, platoon, company, and battalion/task force levels. Training encompasses individual, collective and leader training as outlined in the Army Training Model. Individual training

occurs primarily at home station. This training is devoted primarily to marksmanship, sergeant's time, and drills. Collective training occurs primarily with the use of such TADDS as UCOFT, SIMNET and PGT. Leader training, at the higher echelon levels, is conducted primarily by the use of the constructive models, the final CMTC rotation, BCTPs and other US and NATO Command Post exercises conducted throughout the training cycle. Two training periods a year are spent at Grafenwoehr. Emphasis is on gunnery training primarily at the crew and platoon level. This includes PGT, gunnery tables through XII.

Battalions or Task Forces must show proficiency in the Battle Focus Trainer and SIMNET prior to the annual CMTC rotation. Battalion staffs conduct further training with BBS just prior to conducting its maneuver rotation while at CMTC. The strategy is flexible. Units do not have to conduct each step in sequence. The integration of simulators and battle simulations into fire and maneuver training is the crux for the USAREUR training strategy. Battalion and Task Force level training culminates in a battalion TF maneuvering on the ground at CMTC. Details of a typical CMTC rotation are described.

CMTC

During the first three days at CMTC, units engage in pre-combat checks while the battalion staffs conduct further training (Warlord) with the BBS. This is followed by a five day period where the platoon and company conduct battle drills which end with a road march to the maneuver area. The maneuver exercise occurs over the next ten day period. Realistic combined arms training is provided for battalion task forces and associated support slice in a force on force exercise against an intelligent and aggressive OPFOR. A realistic battlefield is provided using the Multiple Instrument Laser Engagement System II (MILES-II), obstacles and mine fields. Casualties are treated and evacuated. Resupply is required for sustainment operations.

Missions include movement to contact/meeting engagement, defend, and attack under a variety of environmental conditions. These missions are free play and characterized by high intensity and high stress. Several training days are devoted to Operations Other Than War (OOTW). During this OOTW phase exercise scenarios incorporate incidents to train Rules of Engagement (ROE) and challenge the judgment and restraint of the participants. Soldiers in civilian uniforms or specially hired civilian role players are used to create a realistic environment. The final three days are spent in post-op recovery and the final task force after action review.

A take home packet is developed for each rotation at CMTC. The follow-on home station training is developed based on the take home packet. It provides the battalion commander with the knowledge of where emphasis needs to be placed to eliminate short comings while continuing to hone the unit's strengths. Special areas of interest are rehearsed in the BFT or other simulations.

The lash up of the CMTC BBS and live maneuver conducted on common battle space provides an excellent opportunity for the Brigade TOC to exercise, having to control both Battalions in a coordinated fight. This CPX for the Brigade can be further enhanced by tying in a third battalion exercising in SIMNET, as explained below.

STOW INTEGRATION

DIS technology enables the expansion of training from the level of a two task force brigade to a "full brigade". The combination of Live, Constructive and Virtual training entities into a single training exercise at the brigade level was demonstration during AR 94. These

entities were the CMTC, BBS and SIMNET. The ability to train at platoon, battalion and brigade levels, simultaneously and interactively, created a training synergism whereby the training value was increased through a higher level of combat realism.

The integration of the three entities provides comprehensive horizontal and vertical training of the entire staff across all BOS elements. Cross boundary fights and interactions between the units enhance the training. Each of the entities provides a different level of benefit across the seven battle field operating systems. When integrated and trained together in STOW, these benefits are shared across each of the entities to provide a more realistic exercise for each unit. During a period of declining training resources, this capability is a vital training multiplier.

When used as part of STOW, the BBS battalion will contribute its simulated forces (e.g., tank, infantry, OPFOR) to the over all battle played by the combined task forces. The effectiveness of BBS is thus augmented to include all battle field operating systems. As one of the brigade's task forces, SIMNET's mission becomes more realistic and challenging as part of larger tactical operations, and is also further influenced by the status of the other battle field operating systems. The brigade commander located at his TOC at CMTC will have full horizontal and vertical control of each BOS comparable to an actual battlefield. Battle command is exercised to its fullest extent during these complex exercises.

As a result of the different tactical contributions of each entity to the exercise, the scope and complexity of the training is increased with the need for less supporting resources, e.g., manpower, terrain, fuel and ammunition. Training occurs uninterrupted at each level while contributing to and being influenced by the results of the adjacent levels. Assessment can occur at each echelon of training. The genesis of mission failure at any level can be traced to the actions of that level or to the contributing actions or decisions of other echelons. During Atlantic Resolve 94, General Gordon Sullivan, CSA, remarked, "STOW provides an unprecedented multi-echelon training and leader development environment."

ATLANTIC RESOLVE CONSOLIDATION

AR is a joint and combined exercise involving all US services, several US commands and agencies, and NATO countries in a scenario designed to exercise a possible world crisis action. It is USEUCOM's premiere exercise. HQ USAREUR & 7th Army is USEUCOM's executive agent for the conduct of Atlantic Resolve. It is the replacement for the REFORGER series of exercises and focuses the training at the highest level on the current world environment. It is a computer simulation driven exercise that employs a variety of simulations, Distributed Interactive Simulation (DIS) technology and the Defense Simulation Internet (DSI) to represent the full spectrum of war. AR also provides an opportunity for evaluating current and emerging doctrine and Tactics, Techniques, and Procedures (TTP).

Atlantic Resolve is more than a single exercise. The overall concept is to link a series of theater exercises to improve combined/ multinational operations, contingency operations, the reinforcement of Europe and conduct of a Joint/ Combined War fight. The key is to exercise as we would have to respond in real world; starting with crisis initiation, theater planning, major strategic force movement (deployment), war fight, sustain the force, cessation of hostilities, and redeployment. The AR 94 exercise was designed to demonstrate US and NATO capabilities to rapidly deploy a combined JTF in a crisis action

scenario and then reinforce the Central Region from CONUS.

The Joint Operations Planning Execution System (JOPES) and the Allied Deployment Movement System (ADAM) were employed during the initial planning phases of the exercise to support the Time Phased Force Deployment List (TPFDL) development and deconfliction. This was truly the first exercise that addressed the issue of deployment of a multinational force into a theater of operations, an unparalleled training event for the planners and movement control players.

The actual movement of the force into theater was conducted through the use of the Theater Transition and Sustainment Model (TTSM) which provided the necessary detail to execute, track and train on issues that arise during the deployment and reception phase of such an operation.

The major theater war fight was supported by the Confederation of Models, consisting of CBS, AWSIMs, RESA, TTSM, TACSIM. CBS, AWSIM, and RESA provide the major ground, air and naval war fight functionality and sustainment of the force. National level collection assets are portrayed by the Tactical Simulation (TACSIM).

The AR 94 STOW-E portion of the battlefield consisted of a brigade with one battalion in each of the environments of constructive simulation i.e. BBS, virtual i.e. SIMNET, and live i.e. CMTC. The live units instrumented at CMTC were further enhanced by support of additional virtual representations such as Air Force tactical air support for the ground force. The STOW-E battle outcomes were interfaced into the overall simulation architecture through a manual interface to the CBS model. This interface could be automated in future exercises.

The models as well as the exercise participants are positioned at home station to the extent possible while still providing the level of realistic interface by means of a sophisticated communications network. The models provide the foundation for the exercise, executing the commanders orders and providing the resultant outcomes.

Just under 10,000 soldiers were involved in Atlantic Resolve 94, including the “live” brigade force. In 1988, REFORGER involved almost 100,000 participants. The 10,000 participants in Atlantic Resolve represented approximately 225,000 soldiers in the replicated FTX. During the Atlantic Resolve Exercise, the visualization of the battle for the JTF commander and his subordinate staff was practically seamless.

While cost comparisons are difficult to make, General G. Sullivan, CSA, estimated that Atlantic Resolve provided better training at 10-20% of the cost. He said that, “Atlantic Resolve 94 represents another significant step forward in the sophistication of our ability to replicate war - not just for training, but for the full range of doctrinal development, requirements generation and validation, and the development of joint and combined tactics, techniques and procedures...I have never visited an exercise where the participants were more engaged or were being better trained. Atlantic Resolve was indeed a watershed event.”

TRAINING MULTIPLIERS

The following techniques help to assure training effectiveness and also serve as training multipliers. They promote training to standard, cumulative training and training realism. They assure that each training step builds upon the previous step relative to realistic standards.

Training Gates: A “training gate” is a task(s) grouped in a training event that a soldier or unit must perform to standard prior to progressing to more complex tasks or events. The

gate strategy: lets commanders see how subordinate units are doing; gives subordinate commanders feedback to train for higher level events; precludes unready units from wasting precious training resources (ammo, optempo, range time, etc); and is a prerequisite prior to the maneuver and fire event.

Standards: The use of measurable, army-wide, standards for training performance ensure the force is combat ready. They assure divisions trained in USAREUR are as well trained as any in the U.S. Army. The importance of this concept was demonstrated during Desert Storm. These standards are: objective and measurable; established by HQDA; directive in nature; applicable army-wide

Opposing Forces: The OPFOR is a dedicated maneuver task force with its associated slice elements highly capable of portraying Soviet doctrine or variations based on country specific intelligence. This TF opposes all rotational units at CMTC and has proven to be a formidable opponent.

After Action Review: The AAR is a professional discussion with the active participation of those being trained. A form of assessment/ feedback, it focuses directly on the training objective. It is the basic training assessment/feedback tool for all types of training at all echelons. At higher echelon levels of training, such as CMTC, critical items of the METL provide an assessment theme. The OC's identify the critical incidents or performance omissions that affected battle outcomes.

Continuous High Level Training: A guiding philosophy of USAREUR training is to maintain a high level of training readiness through continuous training, free of distractions and interruptions. This allows training to build on previous levels without the need for remedial training due to gaps in training. The importance of continuous high level training cannot be over stressed. The razor sharp readiness of the soldiers in Desert Storm resulted from this emphasis. It is possible due to the stability of three year rotations to USAREUR. Long term unit stability is needed to assure a high level of readiness through uninterrupted continuous training.

SUMMARY

By means of USAREUR's training strategy, USAREUR's training resources are rolled over and cascaded into higher training echelons increasing training effectiveness and synergism. Training costs are reduced by the reduction in live fire training and maneuver of larger troop units to support CPX exercises. The realism of the tools and supporting data bases also provide a rehearsal capability before actual operations.

Despite the increase in virtual and constructive simulation, USAREUR maintained the necessary degree and level of live fire and maneuver training to assure the necessary troop exposure to the realities of actual combat. USAREUR is doing more with less thanks to the latest technological advances and their creative synthesis into a cost effective training program.

Recent force structure changes and reductions placed increased demands and requirements on USAREUR training to meet changing missions. USAREUR's training strategy has met this challenge. USAREUR forces are ready as a formidable forward presence, capable of deploying anywhere on short notice to accomplish its mission.