

# Marine Corps Ground Training

The efficacy of simulations in Marine Corps ground training

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*Our people have always been the Marine Corps' center of gravity and the key to our success as warfighters. Their ability to think critically, innovate smartly, and adapt to complex environments and adaptive enemies has always been the key factor we rely on to win in any clime and place.*

—Gen Robert B. Neller

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ing mindset to effectively prepare for the future.

Warfighting experience can rapidly dull without a sustained institutional commitment to naval, expeditionary combined arms competence and a steadfast focus on training the Corps' most precious resource: the individual Marine. In an austere and volatile strategic environment, the Marine Corps must constantly seek ways to realistically, efficiently, safely, and cost effectively train within a broad spectrum of mission sets. Fully integrating ground simulations, simulators, and emerging technology solutions into our training approaches at all levels—from the MEF staff to the fire team and individual Marine—will enable the Marine Corps to achieve these goals and better embrace the “certainty of uncertainty” in an increasingly complex global security environment.

## Combat Readiness and Maneuver Focus

Expeditionary combat readiness is the Marine Corps' *sine qua non*, and it demands a detailed and aggressive training focus across the force. Combat readiness results from the development and integration of a variety of mutually reinforcing attributes and factors most notably leadership, education, experi-

ence, individual skills training, MOS proficiency, threat knowledge, individual and unit tactics, force employment considerations, and weapons systems proficiency. It can be enhanced through participation in real-world combat operations; however, readiness achieved in this manner is gained at considerable risk or cost, typically occurs episodically or sporadically in different contexts, and is difficult to fully replicate or sustain over time.

Combat experience gained in one operational context does not necessarily translate fully to a different operational environment or requirement; likewise, the adaptive use of technology, information, and new tactics, techniques, and procedures (TTP) by potential foes can quickly negate the advantages of past or recent combat experience, requiring rapid adaptation and dissemination of lessons learned across the force. War remains a violent interaction of opposing wills, and skillful practitioners of this art intuitively understand the iterative and cyclical nature of warfare regardless of domain. Combat readiness will always encompass a requirement to be physically fit; mentally and morally resilient; technically and tactically proficient; knowledgeable of an enemy's political, cultural, social, and military makeup and history; and consistently

The Marine Corps' Title 10 responsibility is to be the Nation's premier expeditionary force-in-readiness. The Corps is charged and expected to always be the “most ready when the Nation is least ready.” Its history is replete with examples in which adherence to this mandate and a propensity to adapt and innovate both saves lives and enables the attainment of key national security objectives. After years of recent land-based combat engagement, the Marine Corps remains a capable, engaged, and relatively experienced force. However, as current threats evolve and new ones emerge, Marines must adapt their train-



**Combat readiness includes individual skills training.** (Photo by LCpl Kerstin Roberts.)

exposed to a robust, progressive, skills-based training regimen that prepares a unit or force for operations in anticipated joint or combined operational environments.

Further, the Corps' ability to individually and collectively maneuver physically, temporally, spatially, and cognitively faster than our opponents in multiple dimensions and domains—often concurrently and at multiple levels—will dictate success or failure on tomorrow's battlefield. This broader philosophical standard must underpin Marine Corps training standards, warfighting mindset, and approach to combat readiness; it must be instilled in Marines at every available opportunity.

### **Role of Simulation in Home Station Training Environments**

Adapting home-station training to address emerging threats underpins all aspects of warfighting readiness, providing a base on which to build and sustain a force's ability to meet the most likely and most dangerous current and future challenges. In preparing Marines for combat, leaders assess the range of likely threats and missions they may encounter, and the environments within which they will most likely occur. Then they tailor individual and unit home-station and pre-deployment training requirements toward accom-

plishing routine, critical, or enabling tasks and skills necessary to achieve mission success against these threats under anticipated conditions.

No training scenario or environment—short of combat against a live, thinking enemy force—provides the degree of risk or stress an individual or unit will face in war. Marines have historically defaulted to conducting realistic, physically demanding live training scenarios to prepare for combat. Practically, however, live home-station training has always involved elements or aspects of simulation based on force preservation requirements and the inability to fully replicate combat threats or theater environmental conditions or hazards locally. Appropriately, Marines continue to rely on combining physical stress within challenging local training scenarios to develop the mental agility, presence of mind, and resilience necessary to simulate the rigors of a decentralized approach to maneuver warfare. Through a realistic, performance-based, building block training and readiness (T&R) methodology, Marine units progressively advance through individual to collective and MAGTF-level training events in environments that attempt to replicate anticipated theater environments to “train like we fight” and prepare for a range of likely employment scenarios.

### **Value of Simulations in Sustaining a Training Edge**

Today, military forces can leverage ground training simulations that model anticipated combat environments and scenarios. Simulation-based training events can be designed to improve individual and collective proficiency in performing tactical and staff actions, procedures, and processes to effectively refine and blend realistic procedural execution and immediate actions with scenario-based decision making. Simulation use also allows Marines to more effectively rehearse, visualize, and anticipate potential outcomes of discrete friendly and enemy actions at the individual, staff, and unit levels before further applying skills and lessons learned in live environments.

Simulations are no training panacea—they typically do not replicate many of the traditional physical demands of combat and fatigue on the Marines who use them. However, well-designed simulation-based training can be very effective in replicating mental stress, posing decision-making challenges, and testing the ability of Marines to respond to unexpected stimuli in a progressive or non-linear fashion. The use of training simulation, as a precursor to or integrated with field training, can enhance experiential proficiency while mitigating traditional home-station training constraints, such as range space and capability limitations, environmental concerns, weapons systems maintenance and employment costs, and unacceptable individual or unit training risks.

Increasing repetition through the use of ground simulations or simulators can improve individual and team cognitive skills, technical proficiency, communications procedures, and recognition decision-making abilities in less time, often at reduced cost and with less operational risk. Their integration within a traditional training program can enhance unit operational capability and readiness while increasing individual and small unit proficiency and sustainment of skill currency. Simulated training can be scripted (to ensure specific training objectives are addressed) or free-play (to challenge the training

audience with a creative, thinking opponent), focused on initial training or remediation, and enhanced by adjusting environmental variables to increase stress and build confidence progressively prior to conducting live training events. It can also be used to experiment, train skills too dangerous to be trained live, test courses of action, conduct mission rehearsals, or integrate training for units in separate geographic locations. These potential benefits are relevant for all elements of the MAGTF, even though training system requirements vary for different functional areas.

**Current State**

Existing Marine Corps ground simulations provide numerous opportunities to train Marines in a variety of tactical tasks, rehearse procedures and immediate actions in tailored and repeatable scenarios, engage as teams in response cells supporting staff training, and develop recognition decision-making skills that enhance subsequent live training. The rapid advent of virtual reality (VR) and augmented reality (AR) capabilities<sup>1</sup> offer many practical opportunities to enhance training by allowing Marines to interact with digital 3D models and environments in new ways. VR/AR capabilities can effectively supplement MOS training at formal schools and provide cost-effective, deployable skill sustainment throughout the Operating Forces<sup>2</sup>; possibilities range from rehearsal of critical hands-on maintenance procedures on realistic, synthetic system models to visualizing ship spaces, rehearsing embarkation procedures, and proofing ship embarkation plans and loadouts to simulated target engagements. Continuous Service-level examination and identification of existing training gaps and critical skills that can be enhanced through VR/AR training solutions is essential to optimize the range of simulations capabilities and part-task trainers available today.

As ground simulations become fully integrated into training plans, an increased ability to blend live and simulation-based training seamlessly throughout the MAGTF will enhance our collective training efficiency and

warfighting effectiveness across the force. Linking existing and future simulations capabilities through a modular, open systems approach and refactoring simulation components into a service-oriented architecture will permit greater integration and training readiness across the MAGTF. This could reduce the time, cost, and risk associated with traditional MEU or ad hoc SPMAGTF pre-deployment training regimens for selected Marine Corps Tasks; however, it cannot be realized without an investment of resources to develop and field the interoperability solution. Maturing and growing a robust Marine Corps Synthetic Training Environment (MC-STE) requires a willingness at all levels to embrace the training potential inherent in available simulations and emerging technologies, and an innovative commitment to leverage and resource that potential to better prepare Marines for the rigors of conflict. For several years, our sister services invested in live, virtual, and constructive (LVC) training integration programs—for example: the Navy Continuous Training Environment, the Army LVC Integrating Architecture (and its next-generation replacement, the Synthetic Training Environment), and the Air Force Distributed Mission Operations Network. Although the Marine Corps Aviation

Distributed Training Environment provides integrated training across flight simulators and the MAGTF Tactical Warfare Simulation can leverage joint and other service networks to support distributed staff training, the Marine Corps currently has no funded program<sup>3</sup> to provide distributed, integrated training capabilities between the training systems and command and control systems of all MAGTF elements.

**Vision in Action**

The Marine Corps is currently at a strategic inflection point in how it leverages ground training systems and emerging technologies to achieve, enhance, and sustain combat readiness. The current confluence of limited fiscal resources, an operational imperative for conducting disaggregated and distributed operations, and the demonstrated training and skill sustainment potential inherent in training-enabling technologies and simulations provides unique and necessary training opportunities with delivery solutions that can leverage the ingenuity of Marines in new and exciting ways.

The 36th Commandant of the Marine Corps, Gen Joseph F. Dunford, Jr., recognized this in his 2015 planning guidance:



**Training simulations are opportunities to train Marines and enhance immediate action in a variety of situations that may be encountered in combat. (Photo by LCpl Alexa Hernandez.)**

Our investment in training systems will reflect the priority we place on preparing for combat and being fully integrated with training and readiness standards. I expect all elements of the MAGTF to make extensive use of simulators where appropriate. My intent is for Marines to encounter their initial tactical and ethical dilemmas in a simulated battlefield vice actual combat.

Our 37th CMC, Gen Robert B. Neller, echoed these sentiments in *FRAGO 01/2016: Advance to Contact*:

We must capture what is being done now across the force and training establishment, integrate those actions today, and incorporate a path forward that will capitalize on emerging technologies and future opportunities. Concurrently, we will work to leverage a virtual and constructive training environment and tools to train our major subordinate command and major subordinate element headquarters, focusing on our leaders. Enabled by technology, we will increase the amount of training each unit can accomplish—to “increase the reps” in mentally and physically stressing environments for all elements of the MAGTF.

The clear challenge for the Marine Corps is to embrace these mandates and appropriately integrate ground simulations in our unit and MAGTF training—honing the force and optimizing resources while increasing the decision making, confidence, and tactical skills of all Marines. Training and Education Command (TECOM) is currently engaged in updating and revising policies and training guidance related to simulation integration within our current community-based training approaches. In 2017, the Commanding General, TECOM published the Ground Training Simulation Implementation Plan to describe the near-, mid-, and long-term vision for establishing a more capable and federated MCSTE. In 2018, an analysis of alternatives for the Marine Corps LVC Training Environment (LVC-TE) was conducted by Marine Corps Systems Command and TECOM, marking a key step in establishing a fully-fledged acquisition program to advance training system interoperability and provide

tools and infrastructure as a service-level capability. The command’s Training and Education Capabilities Division is currently finalizing formal capability requirements for LVC-TE and drafting a more comprehensive MCSTE Campaign Plan, with a corresponding Marine Corps Order to improve the governance and unity of effort for the development and operation of the MCSTE.

TECOM’s MAGTF Training and Education Standards Division (MTESD) has significantly expanded upon Simulator Assessment Working Group momentum to fully integrate existing simulation capabilities within policy revision processes and ground T&R manuals. This work involves the alignment of simulation capabilities with specific T&R events and an analytical effort across Marine Corps ground communities to achieve the right balance between simulation and live training events. As training costs continue to increase, particularly with respect to ammunition, getting the balance correct will ensure that Marines continue to achieve sufficient hands-on proficiency in the employment of major ground weapons systems and in traditional combined arms. Currently, ground simulations fail to adequately address the requirements of all training audiences within a ground community or even within a specific unit’s training population. However, leveraging their potential with the audiences they do support can significantly advance individual and unit readiness prior to progressing to live training, enabling a unit commander to prioritize specific aspects of live T&R events in ways to better achieve the greatest readiness benefit.

Supporting this effort, MTESD has implemented and is maturing a ground training management team (TMT) process designed to identify training gaps by community, consolidate common gaps across communities, and work closely—both within TECOM and across the enterprise—to identify material and non-material solutions for those gaps through the capabilities development and planning, programming, budgeting, and execution processes. The TMT process is conceptually based

on a successful Aviation Training System TMT model and functions in a reinforcing and supporting role to the Operational Advisory Group and the T&R Working Group model in our ground communities. It offers an excellent opportunity for commanders, their direct representatives, and other community leaders to meet in a recurring community-based forum to share training challenges, explore gaps and root causes, posit solutions, and advance ideas for improving training. TMTs are ideal, training-focused venues for deliberating and identifying training gaps that can be mitigated through existing or emerging live, virtual, or constructive solutions. They can advance community-led, TECOM-supported initiatives to advance and codify simulation-based training within our T&R manuals.

Recently, MTESD developed a Ground Simulation Training Reference Manual (GSTRM) that will provide rising training leaders (at the squad level and below) and simulation site training providers with a common reference linked to T&R Manuals that will educate users and enable further robust and engaging simulation training. Of note, GSTRM will introduce small unit leaders to a standardized methodology for conducting training that comprehensively addresses all aspects of a training event—planning, briefing, execution, debriefing, and documentation—and relates it to the Systems Approach to Training and Education. This planning tool, which is intended for coordinated use with a user’s T&R manual, will offer Marines and trainers a “common sheet of music” to improve training coordination, preparation, and integration. It has the potential to prepare Marines mentally and procedurally through efficient “reps and sets” that precede or supplement live training events. GSTRM will be accessible to Operating Forces training stakeholders via the Ground Simulation Training Resources link on the TECOM MTESD Sharepoint portal.

### Way Ahead

The Marine Corps is known for embracing and leading change while striving for tactical brilliance, particularly in



**The Marine Corps is moving toward balanced training between simulation and live training events.** (Photo by Sgt Jesus Sepulveda Torres.)

our steadfast commitment to training execution and combat readiness. In this regard, Marine leaders have a professional and moral imperative to train and develop the Marines in their charge to their fullest potential. Reflecting on a proud legacy of institutional innovation and individual resourcefulness, all leaders should strive to gain a detailed understanding of the tremendous potential inherent in existing simulations and emerging technologies by committing to leverage that potential to improve unit readiness.

By doing so, today's leaders can help inform and drive an important training transition in our Corps—transforming cultural inertia into innovative energy where those opportunities exist while encouraging their Marines and small unit leaders to take greater ownership of their training programs and efforts. Leaders should embrace and leverage the innate ability and skills of a current generation of Marines who are very adept at thinking and performing in synthetic environments—not to the detriment of live training, but to positively reinforce it.

All Marines must move out intelligently, embrace senior leader guidance, and identify opportunities to incorporate simulation training into unit training plans—initially, as a complement to and, eventually, as an integral component of how we conduct initial and

sustainment training at home station and while deployed. Simulations will never fully replace traditional live training methods; however, when effectively integrated with live training opportunities—or federated across communities in ways that increase MAGTF proficiency—ground simulations, simulators, and emerging immersive technologies offer a unique training advantage and distinct tactical edge in today's fiscally austere and encroachment-sensitive environments.

Use of simulations in training offers scenario-based experiences that increase focused task repetition, develop immediate action responses, hone thought processes, enable the rehearsal and validation of procedures and SOPs, enhance situational awareness, and optimize recognition decision making. Federating existing and emerging LVC capabilities within the MCSTE will eventually enable shorter MAGTF training ramp-up times, support greater MAGTF training readiness and skill sustainment, and lead to a more integral understanding of air-ground capabilities at both the individual and small unit levels. It will also provide an additional means to establish and sustain habitual training and operational relationships, and it offers opportunities to sustain hard-to-train skills during shipboard deployments. However, the integration and improvement of MCSTE

capabilities will require senior leaders to make some difficult resourcing decisions. Traditionally, training systems do not compete well against warfighting systems within the Beltway. But as our warfighting systems become more complex, more dependent upon integration for lethality, and more difficult to employ on training ranges, our training simulation systems become an even more critical asset in the generation of warfighting readiness. We should view our training system investments not as a way to generate cost savings, but as an efficient mechanism for increasing and maintaining lethality.

As global commitments increase, dwell times remain a challenge, and home-station training “white space” decreases, training smartly by effectively integrating available and emerging technologies is becoming more of an imperative than a novelty. Integrating simulations into our home-station training and leveraging emerging technologies to broadly support individual, unit, and MAGTF skill development and sustainment will better prepare Marines to respond to both internal and external training challenges and constraints, and to ultimately meet the exigent demands of an increasingly uncertain and volatile security environment.

#### Notes

1. Schneider and Schlereth, “Augmented/Virtual Reality,” Ohio Department of Transportation, (Online: October 2018).
2. Currently, an AR-based training system called Mobile Fire Support Trainer is in development by Program Manager, Training Systems, with plans to field across the operating forces and at selected formal schools.
3. The Marine Corps established its LVC training gaps in an Initial Capabilities Document, which was approved by the Marine Requirements Oversight Council in 2010. A variety of programs is funded to provide simulation-based training systems, but not to provide integrated training across systems, LVC domains, or geographical locations.

