

Our Readiness Problem: Brigade Combat Team Lethality

by LTC Bradford T. Duplessis

“Our fundamental task is like no other – it is to win in the unforgiving crucible of ground combat. We must ensure the Army remains ready as the world’s premier combat force. Readiness for ground combat is – and will remain – the U.S. Army’s No. 1 priority. Readiness is No. 1, and there is no other No. 1.”-GEN Mark A. Milley, 39th Chief of Staff of the Army

If we are to get after GEN Milley’s No. 1 priority, we must first address brigade combat team (BCT) lethality. This article will use the metrics outlined in Table 1, which depict BCT live-fire lethality at the National Training Center (NTC), as well as the observations of the NTC live-fire team as a start point for discussing our lethality challenges and potential remedies.

Two issues exacerbate our lethality problem. The first issue is a personnel system that does not allow for mastery of the fundamental warfighting skills due to the friction associated with personnel turbulence, which is further exacerbated by a lack of decisive-action (DA) experience at echelon. The second issue is that home-station live-fire training does not have the rigor required to build confidence and competence which, with enough repetitions, develops experienced leaders and lethal formations at the BCT and below.

Note that the data referred to within this article, to include the deployment readiness and combat effectiveness of rotational training units, is based on past data from units no longer within the same deployment cycle. This article discusses training improvements currently in place at NTC as well as lessons-learned that must be integrated at home station to enhance combat effectiveness.

	T-80	BMP	BRDM	Squads	Total
Offense	Total: 70 Destroyed: 44 Lethality: 62.85%	Total: 198 Destroyed: 113 Lethality: 57.07%	Total: 79 Destroyed: 41 Lethality: 51.89%	Total: 135 Destroyed: 66 Lethality: 48.88%	Total: 482 Destroyed: 264 Lethality: 54.77%
Defense	Total: 542 Destroyed: 215 Lethality: 39.66%	Total: 497 Destroyed: 265 Lethality: 53.31%	Total: 202 Destroyed: 118 Lethality: 58.42%	Total: 218 Destroyed: 97 Lethality: 44.49%	Total: 1,459 Destroyed: 695 Lethality: 47.63%

Table 1. BCT lethality. This table captures the lethality of four armored BCTs (ABCTs) that trained under live-fire conditions at NTC by outlining the total number of threats presented to the ABCTs and the effects of the BCTs’ weapon systems. Of note is that greater than 94 percent of the “enemy” destroyed during these live-fires were destroyed with direct-fire systems (including attack aviation), meaning that our formations fought a “fair” fight.

NTC live-fire observations

Any discussion of NTC live-fire observations must first provide context by defining the operating environment. The NTC live-fire environment is the best in our Army, as it is the only live fire that allows a BCT commander to maneuver his formation against a peer threat, synchronizing the BCT’s capabilities and those resident at echelons above brigade under live conditions. It is also realistic and complex: formations are not authorized to conduct a leader tactical exercise without troops, dry fire or blank fire prior to the operation; formations can employ the effects of their platforms and systems at their respective surface danger zone (SDZ) or minimum safe distances (MSD); there are no “range fans,” as leaders are expected to control the effects of their weapons systems and also determine the weapons-safety posture and weapons-control status of their formations; and BCTs fight a “thinking enemy” under live-fire conditions, conducting a deliberate attack and then rapidly transitioning to establish a security zone as the BCT begins defensive preparations to defeat an enemy counterattack.

The NTC live-fire team has a dedicated opposing-forces (opfor) cell consisting of an opfor commander, a fires officer and a simulations operator. These Soldiers fight the BCT in a simulation, which is then replicated on the ground by the targets presented, allowing the NTC Operations Group to “fight” the BCT in accordance with DA

Training Environment 2.2 threat doctrine under live-fire conditions. The opfor commander can reposition forces, employ artillery and mortars, employ chemical munitions and synchronize the actions of irregular forces in the brigade's rear area with the actions of his conventional forces to stress the BCT's leaders. This allows leaders to see a cause and effect to their actions, or lack of action.

In addition, the live fire stresses BCT systems. For example, the brigade-support battalion (BSB) conducts a live fire in the BCT's rear area in which the environment supports employment of crew-served weapons, attack aviation, indirect fires, claymore mines and AT4s by our sustainers. The result is stress on tactical sustainment, as the BSB must sustain the BCT over doctrinal distances while fighting both an irregular and conventional threat against the brigade-support area.

BCT synchronization and impacts on lethality. Our Army is challenged with BCT lethality and the synchronization of efforts that enable lethality. As an example, Figure 1 depicts our challenges with synchronizing the warfighting functions in support of a combined-arms breach during live-fire operations.

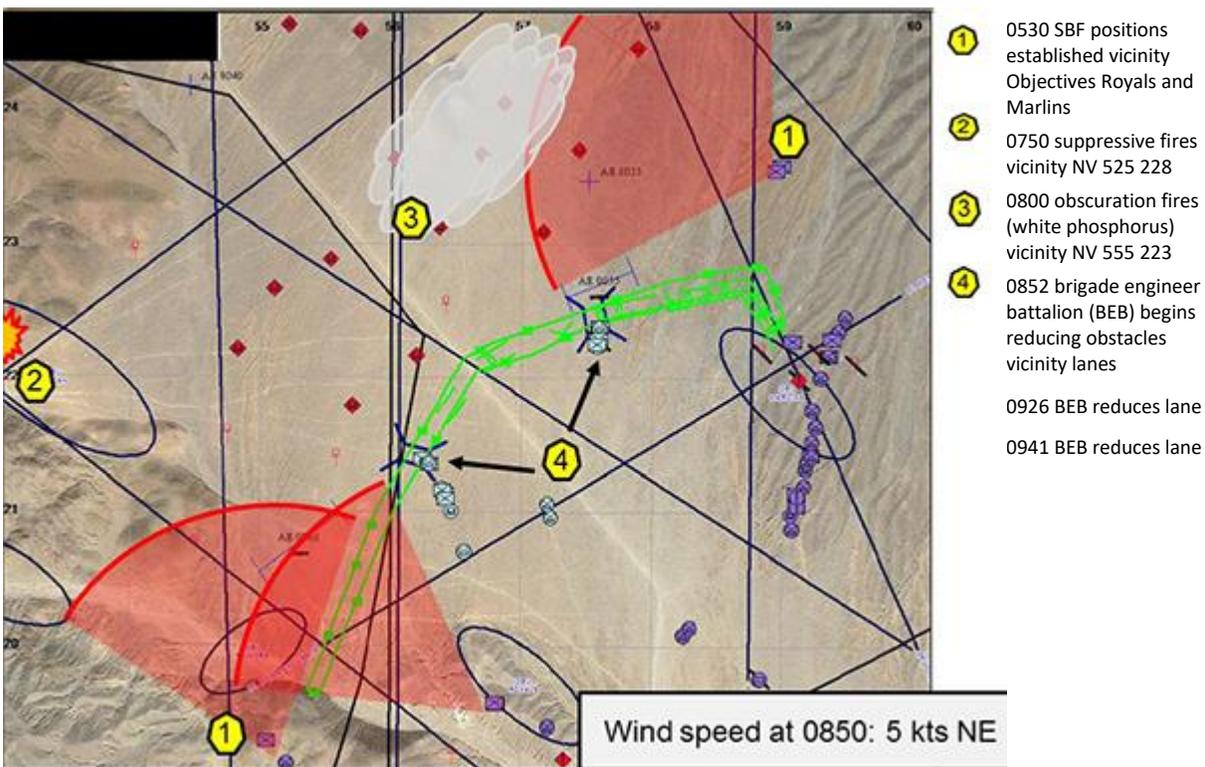


Figure 1. BCT condition-setting to facilitate the combined-arms breach of an obstacle belt. Of note is that the BCT struggled to suppress most "Donovian" BPs overwatching the obstacle with direct and indirect fires while employing ineffective obscuration, despite commitment of the breach force.

BCT synchronization: breach fundamentals. Although pulled from a recent after-action review, the problem depicted in Figure 1 is observed monthly by NTC observers/coaches/trainers (O/C/Ts). Namely, BCTs struggle with synchronizing the fundamentals of the breach, frequently resulting in the unit sequentially employing limited 155mm high-explosive artillery suppression, then employing obscuration – BCTs struggle to mass these effects at the right place and at the right time in support of maneuvering to a position of advantage.

Artillery-delivered suppression and obscuration is ineffective for several reasons. The first reason is that ground-reconnaissance efforts fail to identify the obstacle and the brigade's point of penetration, and to identify the composition, disposition and location of enemy battle positions (BPs) overwatching the obstacle, resulting in an inability to refine the BCT's fire plan prior to crossing the line of departure. This has obvious impact on the brigade's ability to refine the associated technical and tactical triggers that produce timely and responsive fires

synchronized with maneuver. The second reason is that leaders are poorly positioned to both observe the conditions they are responsible for and to communicate.

Both of these issues point to the real problem: a lack of experience.

Ammunition management and direct-fire suppression. To further illustrate our lethality and experience shortfalls, discussion of ammunition management as it relates to direct-fire planning has merit. BCTs routinely divide their ammunition allocation into thirds, resulting in each of its combined-arms battalions receiving the same number of main tank rounds, Bradley ammunition and tube-launched, optically tracked, wire-guided, or TOW, anti-tank missiles, despite these units being assigned different tactical tasks. This ammunition plan does not appropriately resource the direct-fire plan required to suppress enemy BPs overwatching the obstacle. The result is long lulls where enemy BPs are not effectively suppressed and a fire plan that does not facilitate the BCT's penetration of the obstacle belt or the subsequent shifting of direct fires to known, suspected or likely enemy positions to allow the assault force to maneuver through the passage point out of contact.

Leader understanding – experience – of how long their formation must suppress a particular threat to facilitate the BCT opening a lane in the obstacle belt should serve as a start point for ammunition-distribution plans and should also factor into BCT task-organization decisions.

As the BCT transitions from the offense to the defense, poor ammunition management eventually results in one battalion task force going “black” on ammunition as a brigade tactical group enters its engagement area, forcing the BCT commander to commit his reserve – not to exploit success or because the force has met the conditions associated with a decision point, but because leaders at echelon did not possess the experience to allocate ammunition to support the fire plan.

In *ARMOR*'s November-December 1993 issue, MAJ Derek Miller and CPT Rick Avena discuss this requirement in their “Direct Fire Planning” article: “Massing fires means placing accurate fires on multiple enemy threats simultaneously. Firing at multiple targets in depth prevents the enemy from dealing with any single threat and maneuvering or massing his fires against it. ... The commander must fully understand his mission, the enemy, terrain and time. To achieve the required mass to accomplish his mission, the commander may have the majority of his force fight to get key systems in position where they can unquestionably influence the critical point.”

It goes without saying that the point of penetration is the critical point in the combined-arms breach. Figure 2 details how failure to deliver effective suppression and obscuration results in a combined-arms breach that commits the breach and assault forces without properly setting the conditions for success. Specifically, it provides a snapshot of friendly and enemy disposition as well as the maximum engagement lines of enemy BPs that are not suppressed and / or obscured while friendly units are at the BCT's two passage points.

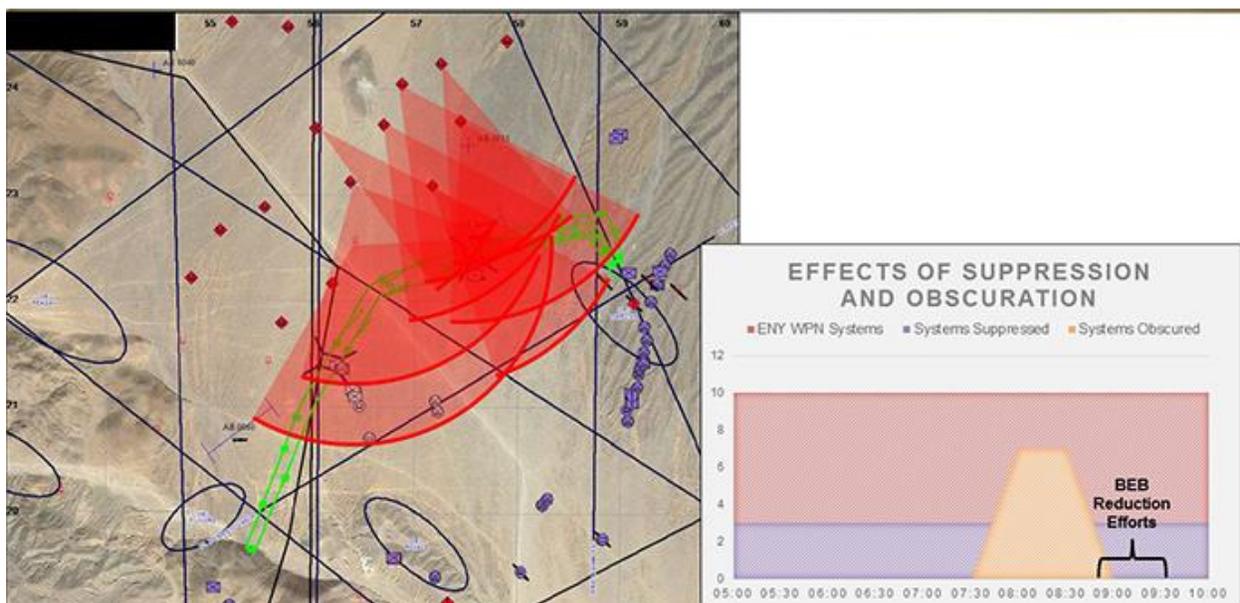


Figure 2. Lack of BCT synchronization in support of the combined-arms breach results in unobserved and unreported “Donovian” BPs being able to effectively engage the BCT’s breach force at both passage points.

Personnel management

Effects of personnel turbulence. The personnel system is contributing to our struggles to build mastery and therefore lethality. Specifically, units are hemorrhaging qualified Soldiers and leaders at a rate quicker than they can build proficiency.

For example, as 5th Squadron, 4th Cavalry Regiment, transitioned from its regionally aligned mission in support of U.S. African Command and prepared to hone its DA skills in preparation for NTC Rotation 15-06 and a future deployment to Operation Spartan Shield (OSS), the squadron lost about 26 percent of its Soldiers due to permanent-change-of-station and end-term-of-service throughout its roughly six-month training density. To be clear, the squadron lost 26 percent of its trained and certified crews, scout teams, mortar sections and squadron staff leaders. As depicted in Figure 3, after the squadron fought at NTC, it transitioned from this crucible leader- and collective-training event into an individual-skills density because personnel attrition necessitated a return to the basics – the squadron found itself losing readiness due to personnel turbulence as quickly as it was built.

Large numbers of Soldiers placed on assignment instructions as a BCT enters its training density to prepare for a combat-training-center (CTC) rotation and for combat should be the exception, not the norm. As the Army increases end-strength in Fiscal Year (FY) 2017, a greater emphasis on manning BCTs prior to the organization meeting its critical training gates is imperative to build readiness. As we transition to measuring readiness via Objective-T, we will no doubt be challenged to generate T-1 level BCTs if we do not address the impacts personnel turbulence has at the BCT level and below.

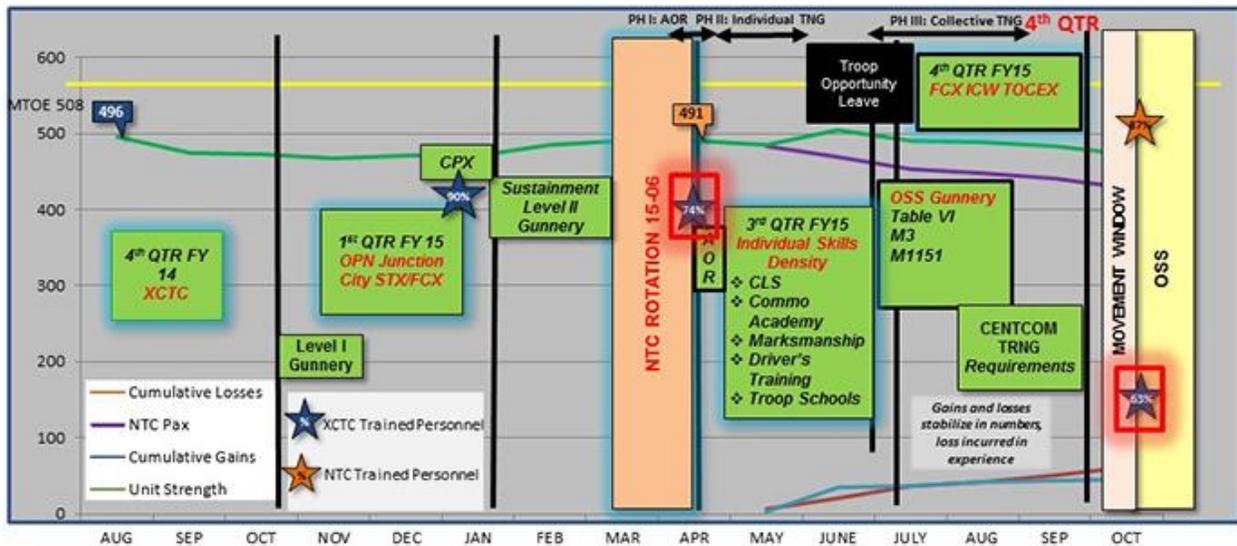


Figure 3. The personnel turbulence 5th Squadron, 4th Cavalry Regiment, sustained as the unit entered its collective training density in August 2014. The squadron lost readiness due to personnel turbulence as quickly as it was built. Gains and losses were measured by assigned strength stabilized over time, but what was lost was experience, a critical component of lethality. Notes: 74 percent of eXportable combat-training capability (XCTC)-trained Soldiers were in the formation on NTC Training Day 1. XCTC and Operation Junction City had built the capability at echelon that was observed on NTC Training Day 1. Squadron staff stability between XCTC and NTC resulted in effective mission CPs capable of synchronizing reconnaissance and security operations; high staff turnover between NTC and OSS required staff training through a TOC exercise (TOCEX).

Crew turbulence and impacts on readiness. Personnel turbulence forces BCTs to allocate more resources such as time, land and ammunition to qualify crews inside of the nine-month crew-qualification standard outlined by our doctrine. A recent American Enterprise Institute study of a BCT clearly articulated the problem: “One mechanized infantry company commander with whom we spoke had recently completed platoon-level live-fire exercises for which he had scrambled to produce a full complement of commander-gunner-driver teams for his 14 Bradleys. In

the intervening 10 days, five of those 14 crews had lost at least one crewmember. ... Moreover, he had been able to field 14 full crews earlier only by gutting the squads of infantry 'dismounts.'"¹

Our fairly recent shift from a six-month to nine-month standard for crew qualification is not a means to build readiness, as it is difficult to argue that reducing repetitions equates to greater crew lethality. The impacts of the nine-month qualification standard, coupled with years of being off our platforms in Iraq and Afghanistan, are witnessed every month during BCT live fires at NTC, where O/C/Ts observe our crews struggle with the fundamentals (such as identification of the threat) despite all targets in the live-fire area having a thermal as well as a pyrotechnic signature to aid in acquisition, proper scanning techniques and lethality. Furthermore, 21 percent of crews come into each rotation unqualified or as a turbulent crew.²

Further degrading our lethality is the fact that about 15 percent of our crews deploy to NTC having missed at least one live-fire gate from the crew- to company-level due to personnel transitions. In total, this results in slightly greater than a third of our crews either not being able to participate in the BCT live fire – or participating in a diminished role such as being authorized to fire from a staked defensive position – as opposed to maneuvering with their battalion task force.

The field-grade staff-officer experience gap. Our doctrine is sound and leaders study it – they know the fundamentals of the breach: suppression, obscuration, secure, reduce and assault, or SOSRA. Leaders can “describe” this operation conceptually, but they do not have enough repetitions – experience – synchronizing this highly complex operation to truly “understand” and “visualize” the operation to both accomplish the mission and protect the force.

This experience deficit is further exacerbated by our policy on moving field-grade officers, the synchronizers of BCT operations, after 18-24 months of key assignments as operations officers and executive officers so they can be broadened. It is important to note that by and large, the current population of field-grade officers leading our staffs did not grow up in a DA environment – whether during home-station training, a CTC rotation or while deployed.

The American Enterprise Institute study already cited pointed out this field-grade officer management problem, highlighting the fact that the BCT its authors observed will lose half its field-grade officers between its NTC rotation and its operational deployment to Europe. The report states that although these leaders are competent, they possess a deficit in experience. Broadening appears to be in direct conflict with building BCT lethality as our field-grade leaders receive fewer tactical repetitions to aid in their development as future battalion and brigade combat team commanders.

The requirement to broaden officers vs. further immerse field-grade officers in our tactical formations to narrow this experience gap is worth further study but will not be addressed in this article. However, one way to mitigate this experience deficit is to make field-grade officer developmental time in tactical formations count more by reinvigorating home-station live-fire training. If we are successful in this endeavor, then we can expect to see an improvement in the BCT lethality metrics witnessed during NTC live fires.

Reinvigorating home-station live-fire training

This article has spent ample time discussing how personnel turbulence impacts readiness, defined as lethality. However, even with the right personnel, we struggle to build lethality because we do not train under the right conditions when conducting home-station live-fire training. As such, when BCTs are faced with the complexity of NTC live-fire operations, their leaders lack the requisite competence built through repetitions and experience to synchronize operations.

Acknowledging that the CTCs have capabilities that cannot be replicated at home station, leaders at echelon must revisit their home-station training objectives and the conditions replicated at home station to build lethality in their formations, to include re-addressing unit-gunnery programs and training their staffs to enable lethality.

Return to the six-month qualification standard = lethality repetitions. Personnel stability and more repetitions via a return to the six-month qualification standard would be a step in the right direction in righting crew lethality, as it would build not just crews, but experienced crews. Experience over time equals readiness – in our business, this means lethality. When Major League Baseball teams build readiness at spring training (analogous to our CTC

rotations) in preparation for the season (our operational deployments), they solidify their rosters – their personnel. They also take more ground balls and at-bats, not fewer. We are the professional athletes of warfighting and should have a similar approach by returning to the six-month crew qualification standard and by removing the concept of turbulent crews from our training doctrine in an effort to increase our lethality “at bats” at home station.

Closing the threat-acquisition gap. Another way to increase lethality is to improve crew scanning techniques and threat-acquisition skills. There are several options available to address this training shortfall. The simulation options in the Advanced Gunnery Training System (AGTS) and the Bradley Advanced Training System (BATS) have the capability to not only ensure our crews meet the requisite gates to live fire but to also possess advanced scenarios that can be tailored by unit master gunners and senior instructor-operators (IO) to train threat acquisition.

For example, AGTS has more than 100 advanced-gunnery skills exercises available to our crews after they have met the gate to live fire that can be used before crew qualification or as part of sustainment gunnery. These scenarios build in complexity and afford the IO the opportunity to vary the weather and visibility to force crews to manipulate their optics and to adjust their scanning techniques based upon the environment. Coupled with an IO-led after-action review (AAR), this capability can help reverse the threat-acquisition struggles observed by O/C/Ts during NTC live fire.

Gunnery-table design can also aid in threat acquisition. For example, Training Circular (TC) 3-20.31 discusses the use of 3/4 scale targets during Tables III, IV and V and then a return to full-scale targets for Table VI crew qualification iterations.

In addition, the TC also defines the minimum and maximum lateral dispersions of targets, or the distance between targets presented simultaneously, to stress the scanning techniques and threat-acquisition skills of our crews as a critical component of unit-gunnery programs. For example, when presented with a two-target engagement, the crew should be unable to identify both threats while in narrow field of view, necessitating appropriate scanning techniques to deliver direct fires against a threat while simultaneously acquiring a subsequent threat to the crew.

It is the responsibility of master gunners to proof the range and ensure the design of engagements meets the commander’s intent for building threat-acquisition skills. These skills must be a key focus of vehicle crew evaluator (VCE)-led AARs if we are to increase crew performance and lethality.

The roles and responsibilities of master gunners. Master gunners have a critical role in enabling lethality. In addition to their role in developing a gunnery program, platoon and company master gunners should assist the commander in training the principles of fire control, fire-control measures and the effects of the weapon systems organic to the unit (SDZs and MSDs). In addition, master gunners should train threat weapons-system capabilities so our platoon leaders fully understand where they have to transition from movement to maneuver and where their formation requires support, such as obscuration or suppression, to gain a position of relative advantage.

It then becomes the platoon leader’s responsibility to develop the appropriate graphical control measures (GCMs) to facilitate the maneuver of the platoon synchronized with the support required.

At the battalion and BCT level, integrating our master gunners into the military decision-making process (MDMP) is critical. These experienced noncommissioned-officer (NCO) trainers can not only contribute to our understanding of the threat but should be intimately involved in discussions on ammunition distribution and ammunition consumption rates through their understanding of the tactical tasks – such as support-by-fire (SBF) and attack-by-fire – assigned to various formations.

Developing leaders who can fight. Gunnery is our minimum baseline for lethality. It is analogous to hitting off the pitching machine where the hitter knows the speed and location of each pitch in the same manner our crews know the layouts of our ranges and the engagements they must qualify. We must fix this by increasing complexity. Our crews, sections and platoons must face “live pitching” – an adaptive enemy that forces leaders to develop direct- and indirect-fire plans and then adjust them based upon the mission, enemy and terrain.

Figure 2 highlights a missed opportunity where an experienced leader could have impacted the brigade’s operations simply by maneuvering combat power into a position to suppress the threat and facilitate the breach.

We must present our leaders with similar tactical problems at home station. The rote training events of old in which our formations conduct a leader walkthrough, dry-fire iteration, blank-fire iteration and then execute live in the exact manner will not enable our leaders and formations to succeed when faced with the future's unknown challenges.

Although our installation training areas do not possess the 1,600 lifters and 300 hard targets of the NTC live-fire area, scenario design can provide leaders the opportunity to make decisions and also learn from the effect of these decisions. We must also teach our young leaders to employ their weapons systems at their respective SDZ or MSD to break their viewpoint that SDZs and MSDs are "rangeisms," when in fact understanding the effects of our direct- and indirect-fire systems allow a combat leader to mass. Accomplishing this requires a culture change from the tendency to focus on throughput and crew qualifications as the key indicators of readiness. Our focus should be on leader development as it relates to lethality.

Although "blasphemous" to some, conducting a gunnery density where a master gunner directs the maneuver of crews to specific BPs for engagements misses multiple opportunities to train lethality and activities that enable lethality. For example, platoon leaders developing GCMs to control crew maneuver based on an enemy situational template and analysis of threat maximum-engagement lines would operationalize gunnery.

A battalion commander should coach and mentor his platoon leaders in conducting this task in much the same manner that our maneuver forefathers did their "write for life" at Fort Knox, KY, or Fort Benning, GA. Even if not provided with the capabilities, this drill should also include an opportunity for the platoon leader to determine where and when – the trigger tied to a GCM – the formation requires collection and indirect fires to facilitate maneuver. The drill should allow the leader to get another repetition at issuing a tactical order.

This leader-development event would go a long way in training our company-grade leaders to fight with fires and understand their responsibilities in condition-setting well before they are field-grade officers. Over time, the leader task of developing a fire plan tied to GCMs would become as second nature to our platoon leaders as is the supervision of pre-fire checks.

Trained staffs enable lethality. No battalion or brigade commander has ever said, "I can't wait to take the colors so I can conduct a command-post exercise," but we must look at the development and training of our staffs as a means to enable lethality. It is the commander's responsibility to train the staff. This responsibility should not be outsourced to the executive officer or operations officer – they are part of the training audience.

To enable lethality, every gunnery or collective training event should consist of a command-post exercise (CPX) with fully manned and equipped command posts (CPs) operating at doctrinal distances. At the BCT level, this means that a training objective of each company combined-arms live-fire exercise or fire-coordination exercise (FCX) would be to train and certify the staff, otherwise we are relegating our formations to a "fair fight."

Parking the various battalion- and BCT-level mission-command nodes on the same range or at the back pad at the installation's Mission Command Training Center does not replicate the friction our future operational environments and the distributed nature of operations will likely produce. Recognizing that we will never get as much time or as many "ground balls" as we desire, commanders must force their staffs to fight their systems, not merely conduct administrative tasks from the field. CPs should battle-track collective training events as part of a fully developed scenario, which facilitate the following activities / efforts:

- Establishment and protection of mission-command nodes;
- Commander-driven operations process: repetition at delivering planning guidance and leading wargaming to aid in visualization and synchronization;
- MDMP repetition through orders production for staff officers and NCOs;
- Rehearsals:
 - Combined-arms rehearsal;
 - Information collection / fires rehearsal;
 - Sustainment rehearsal;
 - Fires technical rehearsal; and
 - Transition between the tactical-operations center (TOC) and tactical-actions center;

- Development and distribution of the battalion common operational picture (COP) – both digital and analog;
- COP management (in other words, who owns Joint Capabilities Release “Red” inputs and how often are they refreshed);
- Exercise the primary-alternate-contingency-emergency plan;
- Exercise retrans: command, digital fires and digital voice;
- Induce friction by placing a realistic load on mission-command systems;
- Execute / refine TOC battle drills; and
- Operate in a cyber electromagnetic activities-denied environment: conduct operations without Upper Tactical Internet systems.

If battalion and BCT commanders invest the time to execute a CPX in conjunction with each critical training event, O/C/Ts are likely to observe improvements in BCT synchronization during NTC live fires, resulting in increased lethality.

An observation of the NTC live-fire team is that lack of staff experience results in BCTs developing an execution checklist that drives their combined-arms rehearsals and subsequent execution. Execution checklists frequently inhibit initiative and – more often than not – result in the piecemeal commitment of combat power and force a slow tempo because the execution checklist fails to develop event-based triggers that result in synchronization and therefore mass at the right place, at the right time – in other words, lethality.

Conclusion

To build the ready formations required to defeat our adversaries and reassure our allies well into the future, our Army must address the fundamental challenges we face with building BCT lethality by addressing the impacts associated with personnel turbulence. Likewise, commanders must reinvigorate multi-echelon home-station live-fire training so we 1) close the DA experience gap observed throughout our formations and 2) train our battalion and BCT staffs to enable lethality.

The previously highlighted BCT live-fire metrics show the impact of our staff synchronization struggles on the close fight, as some 94 percent of the “enemy” destroyed during BCT live fires were destroyed with direct-fire systems, meaning that our formations fought a “fair fight” – tank vs. tank, Bradley vs. *Boevaya Mashina Pekhoty* (BMP) – resulting in an inability of friendly actions to either defeat the threat or force it to alter its course of action.

We must flip this reality on its head if we are to win on tomorrow’s battlefields. The success of future missions and protection of our Soldiers will likely depend on it.

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Endnotes

¹ Thomas Donnelly and James M. Cunningham, *Army Readiness Assessment, Vol. 1*, American Enterprise Institute, February 2017.

² TC 3-20.31, *Crew Training and Qualification*, March 2015, defines a “turbulent crew” as: “Commanders [who] receive new leaders who qualified within the last qualification period have assessment options to maintain weapon or system qualifications. Commanders can assess two previously qualified leaders from different crews to determine their qualification status when assigned together. This is the least preferred method of crew management and requires the commander and master gunner to make assessments using previous crew records, sustainment training in simulations and other training methods to determine their qualification status. The commander may consider a turbulent crew as qualified when the vehicle commander and gunner have: 1) previously qualified in their assigned position on a different crew within the previous qualification period; 2) displayed crew proficiency during a minimum of eight hours in simulation; 3) successfully completed the simulations gate to live fire with a score of 850 or above; and 4) successfully complete Table I, Gunnery Skills Test.”

Acronym Quick-Scan

AAR – after-action review

ABCT – armored brigade combat team

AGTS – Advanced Gunnery Training System

AOR – area of responsibility

BATS – Bradley Advanced Training System

BCT – brigade combat team

BEB – brigade engineer battalion

BMP – *Boyevaya Mashina Pekhoty*, or Russian infantry fighting vehicle

BP – battle position

BRDM – *Boyevaya Razvedyvatelnaya Dozornaya Mashina*, a Russian amphibious armored patrol car

BSB – brigade-support battalion

CGSC – Command and General Staff College

COP – common operational picture

CP – command post

CPX – command-post exercise

CTC – combat-training center

DA – decisive action

ENY – enemy

FCX – fire-coordination exercise

FY – fiscal year

GCM – graphical control measure

ICW – in coordination with

IO – instructor-operator

KTS – knots

MDMP – military decision-making process

MSD – minimum safe distance

MTOE – modified table of organization and equipment

NCO – noncommissioned officer

NTC – National Training Center

O/C/T – observer / coach / trainer

Opfor – opposing forces

OSS – Operation Spartan Shield

PAX – personnel

SBCT – Stryker brigade combat team

SBF – support-by-fire

SDZ – surface danger zone

STX – situational training exercise

TC – training circular

TOC – tactical-operations center

TOCEX – tactical-operations center exercise

XCTC – eXportable combat-training capability