Need for Escalation of Force Training Capability at the Small Unit Level

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ABSTRACT

Armed Services are focused on enabling every warfighter at the lowest possible level to make decisions. Training repetitions enabling decision making is paramount at the small unit level (Neller/USMC Commandant, 2015). These units must be adequately trained to execute tactics and procedures in order to avoid a "CNN moment." In today's environment, every warfighter is a world ambassador and the media is watching closely. Their ethical decisions and application of the rules of engagement must be part of split second instinctual reaction during mission execution because reduction of civilian casualties is a global strategic issue and priority (Col. Robertson, 2015). The reality is that rules of engagement do not adequately address the benefits of applying measured force through the employment of non-lethal weapons prior to taking lethal action. Likewise, training systems do not support realistic human terrain and behavioral responses to create options to force real world decisions in an environment short of conventional warfare.

This paper will present the potential benefit of incorporating non-lethal weapons into virtual training systems to properly train escalation of force procedures as part of small unit decision making. Included will be the results of a Joint assessment on Virtual Battle Space (VBS3) and the USMC's Distributed Virtual Training Environment (DVTE), the USA's Dismounted Soldier Training System (DSTS) as well as the Service Marksmanship Trainers (Indoor Simulated Marksmanship Trainer and the Engagement Skills Trainer 2) to support escalation of force decisions with assistance from Marine Corps, Air Force, Army, and Federal Law Enforcement Training Center (FLETC) subject matter experts. Recommendations include correcting the distance to target and adding the fidelity of non-lethal weapons, munitions and devices, target bio-effects and crowd behavioral modeling to support appropriately effective performance and situational awareness.

ABOUT THE AUTHORS

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OPERATIONAL CHALLENGE

The missions executed by today's warfighters are highly complex in terms of decision making (proportionate use of force) and laws governing their actions. A single mistake can result in international outrage and loss of the mission. Our warfighters are expected to preserve life during execution of their missions and provide our Nation the ability to defend its actions. The *National Military Strategy* directly states the requirement to "discriminate to minimize unintended consequences" and "deter aggression through forward presence and engagement" (Joint Chiefs of Staff, 2015). How do small units receive training to "discriminate?" Rules of Engagement (ROEs) do not spell out the terms of discrimination in executing escalation of force tactics, techniques, and procedures. The Standing Rules of Engagement (SROE)/Standing Rules for the Use of Force (SRUF) states, "The purpose of the SROE is to provide implementation guidance of the application of force for mission accomplishment and the exercise of self-defense" and that "SROE are fundamentally permissive in that a Commander may use any lawful weapon or tactic available for mission accomplishment unless specifically restricted" (Department of Defense, 2005). However, unit ROEs are typically distilled to the binary choice of not applying force or applying lethal force.

What is a warfighter expected to do after "shouting" commands and prior to shooting? Warfighters are trained to decide whether to shoot or not shoot, but more options are available for the effective employment of measured force. They include Hailing/Warning, Dispersing, Suppressing and Incapacitating the target. That escalation of force process and the available effects (short of lethal or gross physical destruction) must be taught and practiced repeatedly to enable effective outcomes requiring split second decisions during military operations. Beyond the battle space, our warfighters are expected to execute multiple missions that involve restrictions on lethal kinetic actions.

IS THERE TRADE SPACE BETWEEN SHOUT AND SHOOT?

Today's environment requires principled and selective use of force. Warfighters are ethical decision makers and once they make the decision to not shoot, they need options to manage the situation. Determining which force options are most appropriate and effective at the moment is vital. Warfighters are expected to use flexible, low-signature, increasingly discriminate capabilities to minimize unintended consequences. Non-lethal weapons (NLWs) provide Commanders options to deter, prevent escalation, minimize civilian casualties, and limit collateral damage.

The application of measured force includes the employment of NLWs and associated tactics, techniques, and procedures (TTPs). NLWs are weapons, devices and munitions that are explicitly designed and primarily employed to incapacitate targeted personnel or materiel immediately, while minimizing fatalities, permanent injury to personnel, and undesired damage to property in the target area or environment (Joint Non-Lethal Weapons Program, 2013). NLW are intended to have reversible effects on personnel and materiel. In other words, NLWs are intended to provide options short of death or gross physical destruction.

To date over 50 NLWs, devices and munitions have been fielded to bridge the gap between "shouting and shooting" by providing flexible and effective alternatives to complement the use of lethal force. These unique and versatile capabilities enable U.S. forces to tailor precise responses to complex threat situations, minimize civilian casualties (CIVCAS), and limit unintended damage to property and infrastructure. NLW are applicable across the range of military operations (ROMO), provide a valuable de-escalatory option for mission success, and help address the requirements of U.S. strategy (Joint Non-Lethal Weapons Directorate Investment Strategy Reporting).

Analysis of Rules of Engagement

Rules of Engagement (ROE) regulate the use of force and is defined as "Directives issued by competent military authority that delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered." (Joint Publication 1-04 Legal Support for Military Operations, 2011) ROE provides the following three functions: (1) Guidance from the chain of command to deployed units on the use of force; (2) How to transition from peacetime to combat operations; and (3) Provides the framework to facilitate planning. In other words, it defines the way we can engage the adversary. Use of measured force and strategies is inherently part of employing rules of engagement.

Defining when the deployment and use of measured effects such as NLWs is appropriate is difficult. When a hostile act or hostile intent cannot be clearly determined, NLWs provide a capability to address an ambiguous threat. Currently, there are no uniform standards or regulations governing training with measured force and NLWs. The Standing Rules of Engagement does leave the door open for Department of Defense (DoD) entities to employ NLWs at their discretion by stating "The use of Service-approved, unit issued non-lethal weapons, and riot control agents (RCA), including oleoresin capsicum (OC) pepper spray and 2-chlorobenzalmalononitrile gas, is authorized in operations other than war" (Amore, 2013). Note what it states, you cannot use pepper spray in war. It states what is prohibited. It does address what best options are available or expected to be utilized.

The Law of War Manual states, "The United States is not a Party to any law of war treaty that regulates non-lethal weapons as a class or category of weapons (Department of Defense, 2015). Thus, there is no applicable treaty definition of non-lethal weapons for the purpose of applying rules related to such weapons. Accordingly, in practice, the contours of the definition of non-lethal weapons have been developed as a matter of policy for the purpose of applying DoD policies with respect to non-lethal weapons. ROEs allow NLWs when appropriate in executing missions, but what about what is advisable in escalation of force situations?

A review of numerous theater level ROEs issued over the last 25 years did not present adequate language in escalation of force situations by going from verbal warnings straight to lethal actions/deadly force. However, the value of NLWs is realized in many planning documents and standing orders. Joint Pub 3-29, Foreign Humanitarian Assistance, addresses this by stating; "The ROE should specifically address nonlethal force options and employment considerations". Several Combatant Command and Service Policies also specifically address the use of NLWs in their Escalation of Force guidance. NLWs have barely come to the forefront of planning and equipping the force. Add the realistic cost and risks with live training scenarios, and the time for implementing simulated training options needs attention.

Lessons Learned

Ask a warfighter about escalation of force options and you may receive a response along the lines that the only choice they have is lethal force and that they are only equipped with their rifle or pistol. However, a review of submitted lessons learned to Marine Corps Center for Lessons Learned (MCCLL) identified numerous training and operational situations that illustrate the operational challenge of employing options other than lethal force. The use of NLW is often a lesson learned in theater with some missions being more demanding than others in terms of employing measured effects.

A review of submitted lessons learned to MCCLL identified 805 entries on the search term "non-lethal" in May, 2016. Sources of the entries originated from all Services, the Joint Staff, Coalition Commands, Other Government Agencies, Foreign Governments, and Non-Government Agencies (MCCLL 2016, June 14). The MCCLL database demonstrates that the demand for NLW/measured effects (proportionate response) transcends all forms of readiness for both military and civil operations, but details of those entries are not releasable within this paper.

Training Gap

The *Marine Commandant's Planning Guidance (2015)*, the *U.S. Army Operating Concept (AOC) (2014)*, and the United States Central Command (USCENTCOM) all emphasize the integration of advanced technologies and use of simulators and simulations to develop well-trained joint teams that make sound, ethical decisions to maintain differential advantages over enemies with respect to the employment of both lethal and non-lethal weapons. U.S.

Government Accounting Office (GAO) authored a report highlighting the need to provide an enhanced ability to field operationally useful NLW (GAO, 2009). The report cited a shifting military environment where enemy combatants mix with noncombatants creating situations where less-than-lethal force may be required as the reason for more effective testing, training, and fielding of operational NLWs.

Current live-fire range training incorporates problem-solving and decision making in relation to escalation of force. However, live-fire training decision making conditions typically present only two options, shoot or not shoot. Including the option to apply force short of lethal is applicable to all phases of military operations. Current NLW training is primarily conducted as PowerPoint presentations or live-fire weapon use on plastic and paper targets, which trains physical weapon employment, but does not train the individual and collective cognitive skills of employing NLWs during an escalating situation. Current live-fire NLW training is both costly and resource intensive and has limited effectiveness for reinforcing students' understanding of the proper use and effects of these capabilities. Efforts have been made by some groups to go beyond basic use, but those efforts are local Commander driven and not coordinated to any doctrinal training standard.

The gap in existing training is that the decision to escalate force requires situational awareness training based on human terrain, reactive behaviors, and the potential threat. The best options are currently available through industry simulation capabilities for training with simulated human elements in virtual training simulators and simulations. Once the capability is made available, the question then becomes what's the training standard and where, how, and with whom should it be incorporated as a training requirement.

The question of how to best train escalation of force would depend on which learning theory is applied. Principle of exercise implies that repetition is necessary for best performance. Principle of primacy implies the need to be trained the right way the first time vice adding to training after the fact (or last minute requirement before deployment). Whereas, principle of recency would imply it needs to be trained right before deployment (Pax, 1938). Regardless of which theory in the principles of learning is utilized for training, there is currently an absence of adequate training. Better yet, train it from the beginning, train it often, and always before deployment.

Training Requirement Gap

There is no official Joint Mission Essential Task (JMET) or Service specific METs (other than law enforcement military occupational specialties (MOS's)) to train escalation of force. Without a MET, emphasis on receiving the training will not occur; even though, a recognized training gap has been documented at the joint planning level for humanitarian assistance/disaster relief (HA/DR) and kinetic operations, yet there lacks regulation prescribing the requirement. The gap has been documented by Joint and Coalition Operational Analysis (JCOA), CENTCOM, Army Maneuver Center of Excellence, and NLW Interactive Trainer Summit.

Acknowledgement of the *JCOA* (2013) has recommended that deploying forces need training in use of relevant effects and tools. The Army Maneuver Center of Excellence Soldier Surveys identified that NLW Pre-Deployment Training (if provided) primarily consisted of PowerPoint slides rather than live fire training. They noted that if Soldiers were trained on NLW's before deployment, they utilized them. If they were not trained, they did not utilize them. In a few cases, there are standing Commander Orders that NLW Pre-Deployment Training is mandatory, not optional.

Given the recognition of the training requirement gap, the incorporation of Non-Lethal Weapons into Virtual Training Systems is relatively non-existent. Per the 22 Mar 13 NLW Interactive Trainer Summit, System Training Plans for the majority of fielded & developmental NLW's were either waived or did not require Virtual Trainer Integration. The Interactive Training Summit also stated, the Services' training community needs to determine who is providing certification on personnel using NLW's in simulators and evaluate having those simulations as graded events.

Interservice Non-lethal Individual Weapons Instructor Course (INIWIC)

The intent of INIWIC is to provide trained instructors who can assist the commander and service members in understanding the ramifications of unit and individual actions in relation to the tactical situation, and who provide training for situational appropriate force options. INIWIC provides practical understanding of the force continuum, and the ability to apply measured force options in situations that do not rise to a deadly force response or when deadly force is not the preferred option ("INIWIC," n.d.).

The shortcoming in reliance on INIWIC training capability is that this merely provides limited advisors and does not provide every deploying warfighter with force training and adequate NLW experience, nor does it ensure escalation of force employment is learned and executable with confidence. In other words, INIWIC provides system level training/trainers and does not conduct scenario driven integration into operational planning. That confidence can only be obtained with proper inclusion throughout the training continuum for all small units.

Guidance to Utilize Simulation to Train Small Unit Decision Making Skills

Under the *Marine Commandant's Planning Guidance FY 2015*, one main priority is the fielding of capabilities that support Marine Air-Ground Task Force (MAGTF) integration and the development of resilient leaders and sound tactical and ethical decision making at the small unit level. The Commandant expects all elements of the MAGTF to make extensive use of simulators, where appropriate, with the intent for Marines to encounter their initial tactical and ethical dilemmas in a simulated battlefield vice actual combat (Dunford/USMC, 2015).

In the *U.S. Army Operating Concept (AOC): Win in a Complex World (2014)*, the Army describes how future Army forces will prevent conflict, shape security environments, and win wars while operating as part of a Joint Force and working with multiple partners. Specifically, the Army recognizes that decentralized operations in complex environments require adaptive leaders, cohesive teams, and resilient Soldiers that are committed to the Army professional ethic and thrive in conditions of uncertainty. There is an emphasis on the integration of advanced technologies with skilled warfighters and well-trained teams to maintain differential advantages over enemies while employing lethal and nonlethal force with precision and discrimination.

ASSESSMENT OF SIMULATION CAPABILITY

Based on the identified training gap and standing guidance to utilize simulations, there was a need to assess current simulation technology for its ability to train small units on escalation of force related to tactical decision making processes and the employment of non-lethal weapons. This assessment is focused solely on the simulation aspect of the training gap and does not address other attempts to fill in training gaps such as classroom instruction or online courses. In 2015, this Joint assessment was funded by Joint Non-lethal Weapons Directorate (JNLWD) to focus specifically on assessing virtual training devices for the capability to support escalation of force and non-lethal weapons employment tasks. The primary driver of this analysis was the need to assess current simulation technology for its ability to train small units on escalation of force related to tactical decision making processes and the employment of non-lethal weapons.

This assessment specifically targeted the Virtual Battle Space (VBS3) and the USMC's Distributed Virtual Training Environment (DVTE), the USA's Dismounted Soldier Training System (DSTS) as well as the Service Marksmanship Trainers (Indoor Simulated Marksmanship Trainer and the Engagement Skills Trainer 2) for their perceived potential to support the tasks. Its further aim was to identify gaps in training capability that could be closed with additional technology investment. To gain efficiencies and take advantage of lessons learned on prior analyses, this effort leveraged the Army Squad Overmatch Study to refine the data collection methodology, utilize their tailored scenarios, and leverage operational expertise on the selected training devices, particularly VBS3.

This effort was jointly conducted by Joint Non-Lethal Weapons Directorate, Naval Air Warfare Center Training Systems Division (NAWCTSD), Marine Corps Systems Command (MARCORSYSCOM) Program Manager for Training Systems (PMTRASYS), Air Force Agency for Modeling and Simulation (AFAMS), and Federal Law Enforcement Training Center (FLETC). Escalation of Force SMEs participants were provided by United States Special Operations Command (USSOCOM), United States Marine Corps (USMC), United States Navy (USN), United States Army (USA), United States Air Force (USAF), and Federal Law Enforcement Training Center (FLETC).

Approach

The attribute-based fidelity analysis strategy used to determine the capability of a training device to support operational task performance consisted of three factors: tasks, attributes, and devices. A task was defined as any action performed by a warfighter in the performance of their operational mission or job; can be physical and/or cognitive

related to the escalation of force during the Humanitarian Assistance/Disaster Relief (HA/DR) mission scenario. An attribute was defined as any sensory input provided by the training device to the user to provide operational context and influence task performance. In general, tasks are the actions that a performer does in the execution of a job; attributes are those elements that the training environment provides to support task performance. Devices were the NLW capabilities within the simulations being evaluated.

The methodology followed a systematic process of assessing the fidelity of training devices to support task performance and training objectives. The attribute-based fidelity assessment process allowed the team to specify the set of training device characteristics that are required to effectively support task performance. Deficiencies identified in fidelity attributes for each individual task assessed provided the basis for improvements needed to enable training objectives.

In order to evaluate the devices' capability to support these performance areas, the task list needed to capture the operational context as completely as possible. Pursuant to this, the analysis team collaborated with the SMEs to derive detailed tasks based on overarching task categories. There were 138 tasks identified and categorized under task categories of Environmental Awareness, Threat Identification, Tactical Communications, Human Interaction, Movements/Maneuvers, and Weapons Employment. The following seventeen (17) attributes were identified and assessed: physical appearance, tactile feel, physical environment, haptic, systems response, sound bearing, environmental noise, verbal communication, audible signals, static visuals, active visuals, resolution, visual depth, light levels, motion awareness, and horizontal field-of-view, and vertical field-of-view. Every participant was provided a reference sheet with definitions for these attributes that were utilized through the assessment. The results of these evaluations provided insight into each simulator's capability to accomplish training objectives while identifying areas of improvement and upgrade that will yield the greatest return on investment. The scope of effort included only the weapons currently available for use in VBS3 (version 3.4.6), which is the most current fielded version at time of the evaluation.

The effort considered both cognitive tasks involved in escalation of force and decision-making as well as physical weapons employment tasks (i.e., "when" and "why", not just "how"). At a high level, the SMEs agreed that the virtual training environment must support training the following key performance areas: develop situational awareness, read human terrain, assess the need for use of force (lethal and non-lethal), identify the capabilities and limitations of the weapons systems, select the appropriate NLW, and assess the effects of NLWs on human-type targets and the surrounding human environment.

During execution, the SMEs were split into two separate teams, deployed at two different lab locations to assess each device. Team 1 consisted of a five member Army operational team. Team 2 consisted of a five member Joint team from the USMC, USN, USAF, and FLETC created for the assessment. SMEs were asked to evaluate the attributes (conditions and stimuli) required for each task according to specific rating scales to measure how capable VBS3 and DSTS systems were at providing stimuli and conditions based on the developed scenarios.

Training Systems Evaluated

VBS3 (Figure 1) is a virtual, game based simulation application that is designed to train heterogeneous teams on the unique skills required to fight in the combined arms environment. The laptops can operate on a stand-alone basis for individual training or can be connected via intranet for collective training. The laptop suites can also network with live, virtual and constructive (LVC) platforms, and command and control systems via secure communication networks such as Navy Continuous Training Environment (NCTE) nodes for the purpose of training tasks involving teams of Marines and/or joint forces.

Figure 1. Marines training on VBS3

The Dismounted Soldier Training System (DSTS) is a full-body wearable virtual reality simulator procured by the Army for dismounted training purposes (Figure 2). DSTS uses a combination of a helmet-mounted display (HMD), noise-cancelling headphones, motion-tracking sensors, replica weapons, a battery-powered backpack computer, and other technologies to immerse soldiers into a virtual training environment. DSTS uses VBS3 Army requirements as its game platform to create its underlying virtual world.

Figure 2. Army squad using DSTS

RESULTS

The assessment team with SME support created four detailed vignettes which the analysis team prepared for the assessment workshops conducted over two weeks. The vignette designs were implemented following an agile development process that consisted of three five-day development periods followed by a SME review. This approach enabled frequent feedback and enabled SMEs to address priorities quickly. It resulted in VBS3 vignettes that closely aligned with designer's intent, in terms of tasks, weapons employed, model behaviors, and storyline.

The assessment team evaluated the following NLW capabilities: M590 12 gauge shotgun (Point: M1012 slug, Area: M1013 shot), M203 40mm grenade launcher (Point: M1006 sponge, Area: M1029 rubber bbs), M84 flash bang grenade, and M5 crowd control munition. The team was unable to assess the following NLWs capabilities due to lack of modeling in the subject simulation training systems: 12 gauge warning munitions (2), M32 multi-shot grenade launcher, 40mm warning munition, NICO BTV-1 flash bang grenade, GG04 Stingball grenade (hand-thrown or shotgun launched), Tasers, Acoustic Hailing Devices, dazzling lasers, 66MM Vehicle Launch grenades (4), Vehicle Stoppers, and Vessel Stoppers.

Task Execution

The team quickly realized there was a lack of existing joint doctrine and training standards for non-lethal escalation of force options which impacted the team's ability to derive the task list from a standardized source. The analysis team utilized joint subject matter experts to develop the task list which allowed the team to effectively target performance related to escalation of force options and employment of NLWs.

The ability to execute tasks were measured with a Training Task Support (TTS) score. TTS is an assessment of the ability of VBS3 and DSTS to support performance of a particular task. The TTS results are divided into three categories described in Table 3 below. TTS scores were calculated as a weighted combination of ratings of evaluated attributes that support the tasks.

Table 1. Training Task Support Level Definitions

Training Task Support Levels	
Level 3	Training device is capable of supporting operator performance of the task sufficient enough to allow qualification of the operator upon satisfactory performance of the task.
Level 2	Training device provides attributes at a fidelity sufficient for beneficial training but not for qualification.
Level 1	Training device is incapable of supporting training for the task.

The team evaluated 138 training tasks within this assessment. There was close agreement in the results by the two teams. Team 1, the Army pre-existing operational team, determined that the DSTS training device provided limited training value for 19% of the tasks (based on both Level 2 and Level 3 TTS scores combined), while the VBS3 training device provided some training value for 60% of the tasks (based on both Level 2 and Level 3 TTS scores combined). The Joint (i.e., multi-service) team (Team 2), determined that the DSTS training device provided limited training value for 19% of the tasks, while the VBS3 training device provided some training value for 58% of the tasks. The tasks deemed as not applicable (N/A) were those that the SMEs identified as tasks required in the task list, but could not provide evaluation data. Results are summarized in Table 2 below. VBS3 showed a better ability to support a minimal level of training capability.

Table 2. Task Rating Levels

	TTS Level 1	TTS Level 2	TTS Level 3	N/A
Team 1: DSTS	91 (66%)	25 (18%)	2 (1%)	20 (15%)
Team 2: DSTS	84 (61%)	21 (15%)	6 (4%)	27 (20%)
Team 1: VBS3	35 (25%)	53 (38%)	30 (22%)	20 (15%)
Team 2: VBS3	36 (26%)	58 (42%)	22 (16%)	22 (16%)

Fidelity Deficiencies

The assessment highlighted visual attribute issues as a primary task execution driver. Deficiencies included accuracy in visual and system response related to modeling of people. Escalation of force requires decision-making based on human behavior, body language, expressions, reaction to commands, perceived threat, and other environmental events. Therefore the active visuals (the movement of people and objects within the environment), depth perception and resolution (which directly relate to discerning important details such as facial expressions, body language, etc.), and static visuals, play an important role in escalation of force and determining whether to employ lethal or non-lethal weapons.

Of all the non-visual attributes, the one attribute that rated most deficient was Sound Bearing. Participants expressed the importance in discerning direction of sound in order to make the critical decisions involved in the employment of escalation of force options. For example, if they can't see danger, can they hear danger? If so, where is the danger coming from (e.g., people, vehicles, aircraft)?

The ease-of-use of the VBS3 mission editor and the flexibility of the scripting editor enabled developers to quickly develop four completely different vignettes (having different avatars, each with unique behaviors, location, tasks, and actions) connected by the JNLW humanitarian/stability operations scenario storyline. On the other hand, out-of-the-box virtual avatar/crowd behaviors were primitive and required developing a model that enacted realistic actions, motions, and behaviors when an avatar/crowd was approached by an operator and during conflict. The additional modeling is not currently readily available to warfighters. Other areas cited for improvement included the reaction of avatars to operator verbal commands, improved 3D/spatial sounds (no background noise was present during tactical

communications), and higher fidelity wounding models (those that were supported were simplistic and sometimes unrealistic).

Using DSTS for training had some benefits, but it is not without issues as evident in the ratings results. DSTS provides a very immersive experience to the participants, but improvements are needed with its field of view, sound realism, incorporation of proper surrogate weapons, and an increased number of motion-tracking sensors to better capture participants' body motions, and stability with VBS3.

FIRST STEPS ON PATH FORWARD

The assessment team recommended that focus should be placed on modeling accurate firing distances for non-lethal weapons as well as accurate effects on target to enable effective escalation of force decision options. Since even non-lethal weapons can become lethal if improperly employed, accurate modeling would ensure effective training without the risk of collateral damage in the operational environment. Once the NLWs are modeled accurately, focus must be placed on providing human terrain and reaction behaviors in the training systems. Without the ability to "read" the avatars, trainees will be unable to effectively make timely decisions of proper escalation of force options and selection of appropriate capabilities (lethal and non-lethal).

Effects modeling must incorporate point versus areas of effects, accurate firing distances, accurate effects on target (for example: leg hit versus arm hit versus head or chest), and crowd responses to those effects. Once these models are available, scenarios can be developed to exercise escalation of force decision making so that warfighters will see and understand the ramifications of their decisions. Lastly, the team recommended development of service-level doctrine and tactics, techniques and procedures (TTPs) for escalation of force and employment of NLWs, specifically cognitive cues involving human terrain.

In recognition of these recommendations, as the first step, JNLWD is currently developing limited NLW modeling and scenarios that allow student trainees to encounter their initial tactical and ethical dilemmas in a simulated battlefield vice actual combat. This investment will assist with current demand signal in ensuring all USCENTCOM deploying Service units and personnel understand and master the NLW escalation of force requirements in order to reduce civilian casualties and limit collateral damage. This current effort is being completed on VBS3, but with an understanding that VBS3 may not always be the training tool and therefore attempts to develop models as system agnostic as possible are ongoing.

RECOMMENDATIONS

Training Escalation of Force with Measured Force

Live-fire training events, exercises, simulators, and simulations should include options that warfighters have available during an escalation of force situation to include the use of NLW effects. The use of virtual training technologies, such as VBS3 (or other virtual simulators/simulations), may be in its nascent stages for training non-lethal capabilities, but given support from leadership and successful application across multiple domains in the Army, USMC, USAF, and USN, the potential is within reach. It is incumbent upon the Government and industry training community to apply successes in virtual training of use of force capabilities (lethal and non-lethal). Without the ability to effectively train utilizing the tools available, warfighters will not be equipped to make split second decisions on the application of measured force before lethal means when warranted.

Escalation of Force involves much more than just physical weapon employment; it also involves utilizing the cognitive cues necessary to determine the proper level of force required. Specifically, discerning and assessing cues involving human terrain and behavioral reactions are absolutely critical in determining whether force will escalate or deescalate. Services and Industry Partners need to collaborate to ensure training solutions include available tools of adequate fidelities to train to a standard in support of crawl-walk-run training curriculums encompassing virtual, constructive, and live-fire training.

Future capability development documents (CDDs) and capability production documents (CPDs) for non-lethal weapons should include a training requirement to include virtual training system integration. Virtual training systems have limited modeling in terms of human terrain, NLWs and their effects, and reaction. Without proper validated requirements, the available training capabilities will not meet the need.

Mission Essential Task

Providing simulation based training devices alone are not sufficient to train warfighters to identify and utilize these cues appropriately; a doctrinal and instructional structure is needed to assist units in applying the devices to meet operational training objectives. Services have not created adequate METs in response to the operational challenges and Service capability gaps. In order to achieve effective "train as we fight" readiness levels, escalation of force employment in training must be prescribed and repeated through events and exercises leading up to deployment. Without the prescribed requirement to train escalation of force options with NLW capable of applying measured effects, warfighters will not receive the needed effective training.

Joint Standards for Training

Even as the DoD Executive Agent for NLWs and NLW Policy, the JNLWD lacks the authority to prescribe the necessary training (Joint Non-lethal Weapons Program, 2013). It is up to the Services to set the requirements. But there is no existing Joint or Service level doctrine, JMETLs, or agreed upon tactics, techniques, and procedures (TTPs) for non-lethal escalation of force utilization in the battle space. Doctrine changes should consider the inclusion of NLW within plans and in supporting strategic communications that support minimizing civilian casualties and limiting damage in order to gain the trust of the populous.

A Joint Service Memorandum of Agreement (MOA) is recommended with all Services and other government agencies, with the assistance of the Federal Law Enforcement Training Center (FLETC), to address the training shortcomings. This lowers the risk of Service alienation by being inclusive of all training requirements and delivering uniform capability faster than individual Service Unique efforts. A Joint MOA approach can enable coordinated improvements aligned with improved ROEs within a scope of expectations for employing escalation of force options. Each ROE has unique challenges and should incorporate guidance on escalation of force options as identified in the current training gaps.

Such training standards across the Services should incorporate cognitive cues necessary to determine level of force required. Specifically, discerning and assessing cues involving human terrain are absolutely critical in determining whether force will escalate or deescalate. The task list developed by the analysis team utilizing joint subject matter expertise can provide the basis for effectively targeting performance related to escalation of force and employment of NLWs.

CONCLUSION

To enable warfighters at the lowest level to make critical decisions in a matter of seconds, they must receive repeated training in decision making not only for lethal kinetic actions, but to include escalation of force options which deliver measured effects. Escalation of force utilizing measured force should be integrated with existing training vice being a separate non-integrated action. NLW weapons CDD and CPD documents must contain requirements to be incorporated into training systems being utilized by the Services. Supporting training systems must then be designed to include the necessary stimuli, specifically to include NLW modeling, NLW effects, human terrain, and human reactions to use of measured effects employment.

The goal of this effort was to address the ability of available training simulation systems to train small units with the necessary capabilities. The task-attribute based approach utilized allowed the assessment team to specify the set of training device characteristics that are required to effectively support task performance as well as determine which systems provide sufficient simulation fidelity for the mission environment to enable appropriate task performance and which require improvement. Unfortunately, the assessment determined that currently fielded simulator and simulations do not support effective escalation of force options.

Escalation of force decision making skills have to be exercised at all levels of training and with repetition as General Neller stated. Live-fire and simulated training scenarios and exercises must reflect the complexities of uncertain security environments and global demand for HA/DR. The Services need to invest in the engineering support and technical level of effort necessary to improve the ability for simulators and simulations to support effective training of escalation of force options. Execution of the recommendations discussed will enable the Services to meet the National Military Strategy intent to discriminate to minimize unintended consequences and reduce civilian casualties while avoiding undue media criticism of warfighters when performing their jobs.

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