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Integrating Lethal and Nonlethal Effects

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How to View a Potential Target

There are numerous methods to effect enemy targets. Historically, the joint force focused on physical effects, which evolved into effects based operations. A traditional example of this is dropping a bomb on an enemy building with the desired effect of destroying it. One problem however, is that the targeting methodology has not caught up with current capabilities.

In general, there are five categories of characteristics by which targets can be defined: physical, functional, cognitive, environmental, and time (per Joint Publication 3-60, *Joint Targeting*). The physical characteristic includes electromagnetic signature; however, in the target development process, it is common for planners to only analyze the structural characteristics of a target in preparation for a kinetic strike. An example of this would be planning to employ an aerial delivered munition against a target to produce a destructive effect. As the physical characteristics of a target are evaluated for a pending strike, the cognitive characteristics are often overlooked, which includes how the target processes information which could be exploited to produce desired effects.

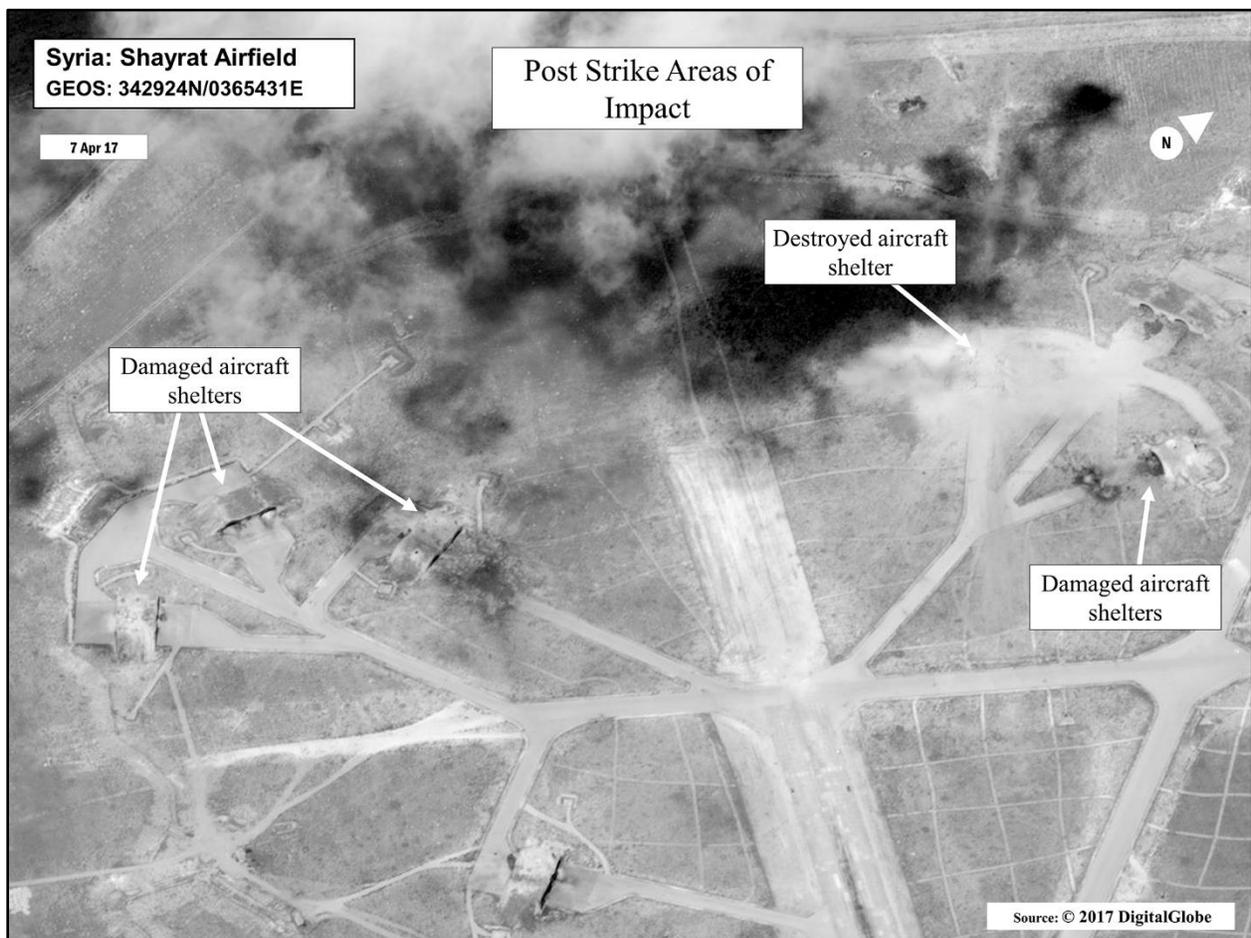
In support of an upcoming operation, intelligence analysts determine when an enemy command and control (C2) node must be disabled to facilitate the successful mission execution. As the target is developed, targeteers determined that dropping a bomb to destroy the C2 building will achieve the desired effect of denying the enemy C2 communications. After further analysis, however, collateral damage concerns in proximity to the building become factors and a kinetic strike is no longer an acceptable option. Only after circumstances like these arise do planners explore other options to achieve the desired effects. This leads to a delay of mission to initiate developing other means to achieve the desired effect; consequently, time becomes a critical factor. To prevent this, all available options to engage a target must be considered from the beginning of the target development process, to achieve the desired effects in the most efficient and effective manner. If additional options were developed for this target, such as an option to employ a network attack to disable enemy communications at the C2 node, the desired effects could still be achieved (in the desired timeframe) to successfully support the operation.

In the current environment, artillery members do not learn from these mistakes and choose to accept degradation in mission versus exploring better ways to mitigate

complications. The adversary's threat modernization and sophistication is turning integration of nonkinetic effects from a historically enabling capability into a necessity. In future anti-access/ area denial fights, successful kinetic options may be predicated upon successful nonkinetic enablers. Combat environments are, inherently, dynamic and the joint force must have flexible options available to deliver desired effects throughout all phases of the joint operation. The result is a more effective and efficient, deliberate and dynamic targeting process with the ability to achieve desired effects in a rapidly changing environment.

Changing how targets are viewed and prosecuted, in support of joint operations, cannot be accomplished by adjustments to the targeting process alone. Organizational structures, personnel, and training requirements are additional areas that require examination. These areas are key in developing targeteers and targeting processes that leverage all available capabilities across multiple domains to present decision makers the optimal options to produce the desired effects.

The following photograph shows target destruction using kinetic effects.



Pictured is a battle damage assessment image of Shayrat Airfield, Syria, following a United States (US) Tomahawk land attack missile strikes from the USS Ross (DDG 71) and USS Porter (DDG 78), Arleigh

Burke-class guided-missile destroyers April 7, 2017. Targets such as these are viewed from a standpoint of how they can be destroyed using kinetic weapons without exploring potential NK means to achieve the desired effect. (Courtesy photo)

Terminology

“The terms ‘lethal’ and ‘nonlethal’ are currently recognized, although not formally defined, in joint doctrine. The existing dictionary definitions of these words describe them adequately. Joint doctrine refers to ‘lethal or nonlethal military force’ (Joint Publication [JP] 3-0, *Joint Operations*), ‘lethal and nonlethal fires’ (JP 3-09, *Joint Fire Support*), and ‘lethal and nonlethal effects’ on targets (JP 3-09). This volume refers to the effects that both lethal and nonlethal weapons and fires have on targets exactly as joint doctrine does.

“Two other terms are in widespread, informal, use as well: ‘kinetic’ and ‘nonkinetic’, [they are] intended to mean, roughly, weapons or actions that cause destruction of targets and those that do not. To avoid confusion, the joint doctrine community deliberately removed all references to ‘kinetic’ and ‘nonkinetic’ in joint doctrine, substituting lethal and nonlethal. Nonetheless, the terms, even though informal, have a somewhat different meaning. They have attained general recognition in the military and elsewhere in the US government, so that even [former] President [Barack Obama] and his close advisors use them. President Obama, for instance, referred to ‘nonkinetic support to [operations in Libya]’ in a letter to Congress concerning compliance with the War Powers Resolution (15 Jun 11).

“[These are] definitions that convey useful and distinct military meaning while keeping them as close as possible to the technical meaning of the terms in physics. Kinetic is: relating to actions designed to produce effects using the forces and energy of moving bodies and directed energy, including physical damage to, alteration of, or destruction of targets. Kinetic actions can have lethal or nonlethal effects. Nonkinetic is: relating to actions designed to produce effects without the direct use of the force or energy of moving objects and directed energy sources. Nonkinetic actions can have lethal or nonlethal effects.”¹

For the purpose of this article, nonkinetic refers to capabilities or means other than traditional air-to-surface or surface-to-surface weapons (such as bombs or missiles) used to affect a target in a non-physically destructive way. Kinetic refers to the traditional ways to provide destructive effects to a target (such as an aerially delivered bomb producing lethal effects). Nonkinetic capabilities to produce lethal and nonlethal effects against a target include airborne electronic attack, offensive and defensive space control, offensive and defensive cyberspace operations, and information operations.

Organizational Structure and Personnel Matters

Target development timelines are not synchronized, and organizations are not properly structured to provide decision makers with all potential options to affect a target. This leads to a lack of joint integrated planning, which leads to the lack of developing kinetic and nonkinetic options to meet target development timelines and constraints to present decision makers with multiple options. Lethal and nonlethal options need to be identified early to present commanders with viable options to account for multiple dynamic variables that arise for potential targets.

Personnel with nonkinetic experience who are aligned within the air and space operations center (AOC) require some examination. As part of the air planning cycle in the AOC, plans are shaped in the strategy division before reaching the combat plans division (CPD) and combat operations division (COD). Because the preponderance of nonkinetic experts tend to reside in CPD and COD, there is a lack of planners with the right expertise embedded in early stages of the planning cycle to help guide the inclusion of potential nonkinetic capabilities. The current process requires planners in CPD and COD within the AOC to match nonkinetic assets and capabilities to requests after a concept of operations (CONOPS) is developed. This current structure and process integrates nonkinetic planners too late in the process, resulting in reactive planning and execution and an inefficient use of nonkinetic capabilities across the joint force.

An interim recommendation to improve this process is to create an on-call mission planning cell consisting of kinetic and nonkinetic experts from the AOC who are temporarily embedded into supported component planning teams during initial CONOPS development. (This will change based on area of responsibility (AOR) requirements.) As the United States Air Force (USAF) grows nonkinetic experts, a future improvement is to permanently embed a nonkinetic liaison officer (NKLO) with the supported component for integrated and synchronized joint planning. This allows USAF planners to be part of the joint force CONOPS development from inception, which will assist with the correct integration, synchronization, and prioritization of joint kinetic and nonkinetic effects. The joint force cannot afford to ignore information provided by joint fires and effects liaison officers with experience in Iraq and Afghanistan.

For example, throughout Operation IRAQI FREEDOM, the USAF, United States Navy, and Marine Corps embedded electronic warfare (EW) officer NKLOs within the Multinational Corps Iraq Joint Fires and Effects Cell. These were the right embedded persons because they assisted at the supported-component level to help the process. These NKLOs helped shape CONOPs early, taught requestors how to request EW properly, etc. The same type of circumstance occurred during Operation ENDURING FREEDOM when NKLOs were embedded in Combined Joint Task Force 76. Because of these successes, it would be prudent to adopt Tactics/Flash Bulletin manning recommendations for NKLO roles and responsibilities in the joint force as well as nonkinetic operations cell (NKOC) and offensive cyber operations integration.

To ensure capabilities and effects are applied in the appropriate place during each stage of the targeting cycle process, nonkinetic subject matter experts (SMEs) with space, cyberspace, EW, and information operations (IO) must be represented in all AOC divisions. Include a nonkinetic planning cell within the strategy division that assists in a long term, centralized focus to nominate targets. Also, include a nonkinetic analysis and targeting team (NKATT) in the intelligence, surveillance, and reconnaissance (ISR) division and an NKOC in CPD to integrate with the target effects team and master air attack plans team to deliver requests to the COD to synchronize effects. The nonkinetic duty officer would lead an EW duty officer, space control coordination

element, and cyberspace duty officer to coordinate space, cyberspace, and EW fires within the AOC and other components across the joint force. Ensuring the right type of experience is sourced with the correct line remarks in the unit manning document is key to gaining the correct SMEs. Including these teams of nonkinetic SMEs would increase the efficiency and effectiveness of nonkinetic capabilities to improve the planning development and targeting cycle processes.

Nonkinetic SMEs from other Services and components should be embedded within AOC divisions. Based on strategic structuring and authorities, this would allow established two-way communications to leverage all joint assets as well as be aware of multiple-domain actions in a specific AOR. Initially, for CONOPS reaching the execution phase, representatives should be placed in the CPD to deconflict multiple-domain fires when they are being executed in the AOR. This allows the USAF to ensure proper use of the limited nonlethal assets and reassign those assets to support other requests. Each Service's members know how to best employ their assets and capabilities. To have the best synchronized and integrated CONOPS from inception, SMEs must be available and established in the appropriate locations to build an integrated and synchronized plan.



The Combined Air Operations Center (CAOC) at Al Udeid Air Base, Qatar is pictured on October 7, 2015. This CAOC provides C2 of air power throughout Iraq, Syria, Afghanistan, and 17 other nations. It is comprised of a joint and coalition team that executes day-to-day combined air and space operations and

provides rapid reaction, positive control, coordination, and deconfliction of weapon systems. Photo by TSgt Joshua Strang, USAF

The Nonkinetic Education and Training Investment

The joint force lacks the appropriate training required to meet targeting and execution process needs. Currently, USAF targeteer and target development analyst training pipelines focus on kinetic and nonkinetic capabilities differently. Training should be reevaluated to include both for targeteers and analysts. This will help build a foundation for an understanding of multiple-domain capabilities and effects. Changing training focus will ensure planners understand the best way to use these skill sets or how they can be leveraged to complement one another. Fully understanding both capabilities will allow planners to provide decision makers the best solution to produce the desired effect on a target, given the circumstances.

Geospatial intelligence analyst courses are starting to address these issues, but they need modifications to ensure target development analysts possess the critical understanding of kinetic and nonkinetic capabilities. Furthermore, this type of training foundation is essential for NKATTs and NKLOs to be able to integrate the best solutions when developing plans prior to their assignment to divisions within the AOC. Training for these positions should include, targeting and planning processes and specialized joint training commensurate with the level they will be assigned. The USAF Air Combat Command's nonkinetic capabilities branch has begun examining what this training should entail. Those receiving training would include personnel in positions within the AOC, joint task force headquarters, or components. Also, this training should be added to the progressions of EW, IO, space, and cyberspace career fields.

Targeting Database Improvements

Current targeting databases are not designed to incorporate nonkinetic attributes required for targeting. The Joint Munitions Effectiveness Manual (JMEM) provides users the kinetic effect for a selected target. However, some databases operate independently and include classification differences. This results in a targeting board being conducted, including target folders that do not contain all potential multiple-domain options to achieve the desired effect. This can lead to a potential missed target opportunity while allowing an adversary the freedom of maneuver through multiple-domains.

Current research and development to modify the modernized, integrated and joint targeting toolbox databases to include these attributes should continue. This could be achieved through developing a nonkinetic JMEM or cyberspace JMEM, however, the joint force must continue to define specific attributes that are required. These databases must be updated, integrated, and invested to ensure the joint force is prepared for major combat operations.

The databases must be constructed so there is only a single-point contact for a target. Multiple organizations must have access to input target analysis in these databases to permit joint collaboration. To maintain confidence and credibility of the database,

specific personnel need to be assigned to adjudicate inputs to ensure the target information is accurate and appropriate.

Live and Large Force Exercise Training

Training ranges need to provide realistic training and effects to warfighters. Separate domain training ranges do not correlate to one another. Live training leads to simulated effects instead of actual effects, providing the end users with unrealistic expectations, understanding, and timing of capabilities. During joint exercises (such as Red Flag, conducted out of Nellis Air Force Base, Nevada), live fly operations are executed on the Nellis test and training range while nonkinetic operations are performed on the space test and training and joint information and operations ranges. However, effects executed on these ranges do not translate to one another because effects from one range are transferred to the other range through exercise administrative injects. The result is an unrealistic expectation of the integration of major combat operations.

Assessing Nonkinetic Effects for the Long Term

The joint force needs to be able to better predict and assess the effectiveness of nonkinetic capabilities. Predicting the effects of a kinetic capability is fairly straight forward. For example, a laser guided, 500-pound bomb used to strike a building will have a relatively known effect. However, when it comes to nonkinetic capabilities, the effects are less predictable. Reliable ways to measure nonkinetic effects, as well as possible second or third order effects that may result from nonkinetic fires, are not fully understood by the joint force. These effects need to be accurately modeled to ensure any potential unintended consequences are known. Realistic assessment methods to predict nonkinetic effects will ensure commanders are presented with likely outcomes when choosing a nonkinetic method to attack a target.

Developing the cyberspace and EW weapons system evaluation programs, in lieu of nonkinetic JMEMs, will help bridge the confidence gap experienced by operational commanders. Also, pairing ISR assets to conduct assessments must be improved.

The improvement of nonkinetic effects assessment is a key area to be evaluated. If not predicted correctly, a nonkinetic capability could produce an unintended effect that can worsen a situation. Therefore, due to the complexity of nonkinetic capabilities and the intended effects, the joint force must be educated on multiple-domains when leveraging these capabilities. At the same time, users must be able to gauge the effect and leaders must accept potential risks.

Conclusion

The joint force must move away from parochial thinking when planning to attack a target. The current model and process are biased toward kinetic options to provide a physically destructive effect against a target. As situations arise that no longer permit this type of option, target prosecution is either abandoned or other options are pursued too late in the timeline to be effectively implemented. The results are missed targets of opportunity or, in the worst case, mission failure.

The joint force must have multiple options on the table to create desired effects against the enemy at a place and time of US forces' choosing. It is only then that friendlies will be able to apply pressure against the enemy rapidly, in a way that will make it difficult for them to counteract.

For this to work, the process of planning for nonkinetic effects needs to happen at target discovery. This starts with approaching the targeting process differently. For the targeting process to successfully integrate all potential effects, properly trained personnel need to be placed in the correct organizational structure to effect change. Once the trained personnel are placed at the right level, more options can be presented to commanders to achieve the desired effects, regardless of dynamic situations that may arise. Having the ability to rapidly transition across multiple domains, through the electromagnetic spectrum, and leverage the appropriate effects will directly increase the efficiency and effectiveness of joint and coalition operations, and drastically increase overall mission success.

In today's and tomorrow's operational environments, leadership must be armed with additional expertise and options. A true "fires" expert can no longer rely solely on kinetic weaponeering.

¹ Air Force doctrine, Annex 3-0, *Operations and Planning* (Updated 4 November 2016).

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