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14. ABSTRACT

While precision engagement has created many tactical options, it does not provide an 'automatic bridge' that connects the tactical level to the operational and strategic levels of war. Operational art is still the basis for translating tactical advantages into higher-level objectives. To do this, operational commanders need to rely on multiple order--or indirect--effects of precision engagement. To do this effectively, these commanders and their staffs need to understand some of the problems of employing precision weapons to achieve indirect effects.

Once these problems are understood, future operational commanders need to find effective ways to overcome them. While some may feel that information technology will be the saving grace that allows us to effectively use precision engagement to produce reliable indirect effects, this

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The Operational Art of Precision Engagement

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Maritime Operations.
The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract

There are those who feel precision engagement has completely redefined how we conduct war. However, contrary to popular perception, the 'revolution' of precision engagement has fundamentally taken place at the tactical level of war. Precision engagement has made the physical, direct effects of a weapon strike nearly flawless. This fact, when combined with the inherent ability of air power to operate in three dimensions, has given commanders options they have never had before.

While precision engagement has created many tactical options, it does *not* provide an 'automatic bridge' that connects the tactical level to the operational and strategic levels of war. Operational art is still the basis for translating tactical advantages into higher-level objectives. To do this, operational commanders need to rely on multiple order--or indirect--effects of precision engagement. To do this *effectively*, these commanders and their staffs need to understand some of the problems of employing precision weapons to achieve indirect effects.

Once these problems are understood, future operational commanders need to find effective ways to overcome them. While some may feel that information technology will be the saving grace that allows us to effectively use precision engagement to produce reliable indirect effects, this solution suffers from a number of shortfalls. Instead, effects-based operations are likely to emerge as a more reliable means to link tactical accomplishments to higher-level objectives, and precision engagement fits into that concept perfectly.

Failure to understand the fundamentally tactical nature of precision engagement and how operational art can turn those tactical advantages into operational and strategic results will end in a campaign that lacks operational cohesiveness and potentially squanders the benefits of high-cost, low-density precision weapons.

THE OPERTAIONAL ART OF PRECISION ENGAGEMENT

The Amiriyah Shelter

In the early morning hours of February 13th, 1991, a pair of F-117A "Nighthawk" stealth fighters prepared to drop their 2,000 pound laser-guided bombs (LGBs) on a target in downtown Baghdad.[1] The reinforced concrete and steel bunker had been on the coalition target list for some time. It had been nominated for attack several times due to signals traffic and daytime satellite photography which showed signs of 'leadership activity.' This site had not been struck earlier because it could not be confirmed that it was truly a military target.[2] However, these two F-117s struck the bunker that night because an Iraqi CIA asset had recently confirmed that it was indeed a military target.[3] Predictably, the 2,000 pound LGBs hit their mark perfectly and destroyed the target, which the Iraqis referred to as the Amiriyah Shelter.[4] This 'shelter' was more commonly known by its coalition target name, the al Firdos bunker. An estimated 400 civilians, largely women and children, died in the strike with another 200 severely injured.[5] While CNN showed live pictures of dead civilian women and children, coalition leaders scrambled to figure out what had gone wrong.

The Difference Between Direct and Indirect Effects

So why did the attack on the al Firdos bunker fail? Or did it? Certainly the bombs destroyed the target as intended, so tactically it would have to be considered a success. Strategically, it failed because it caused political limitations on the bombing of future strategic targets in Baghdad, and perhaps even hardened Iraqi resolve against the coalition. The disparity in the success at the tactical versus strategic levels highlights the two fundamentally different results of precision engagement--direct and indirect effects[6]. Direct effects primarily impact the tactical level of war, since only they include the physical destruction or disabling of the target.[7] "All physical acts in war occur at the tactical level…rarely will attacking a single, specific target

directly produce strategic effects…."[8] However, current Air Force doctrine states that precision engagement should apply to all levels of war, and goes on to say that it is *most* effective at the strategic level.[9] Since direct effects are primarily limited to the tactical level, these desired higher-level outcomes can only be achieved with indirect effects. Hence, this means that we must reliably generate desired indirect effects to be able to impact the operational or strategic levels of war with precision engagement. However, this paper will assert that precision engagement offers no additional advantages over less precise forms of warfare when indirect effects are sought since the rudimentary strength of precision weapons is in achieving tactical, direct effects.

The Three Problems of Indirect Effects with Precision Engagement

In fact, this paper will raise three inherent problems that precision engagement suffers from when pursuing indirect effects, all highlighted by the incident of the al Firdos bunker. First, while precision technology has made the predictability of first-order--or direct--effects tremendously reliable, it can still be difficult at best to predict the second- and third-order effects of precision engagement. The second problem is of paradoxically imposed limitations on the use of precision weapons. The third problem is tendency towards what Michael Handel calls the 'tacticization of strategy' in his book Masters of War.[10] Since Air Force doctrine states that we should be attempting to use the advantages of both air power and precision engagement at the highest levels of war possible, how then can the tremendous tactical options offered by precision engagement be translated into useful operational and strategic outcomes? This paper will look at two possible methods that future operational commanders can use to translate tactical advantage into strategic success. First, it will look at why current and future information technology is not likely to directly link *desired* effects to *actual* effects, then how effects-based operations may be the best way for operational commanders to employ precision engagement.

Problem #1: The Difficulty of Predicting Indirect Effects of Precision Engagement

"In war, that chief incalculable is the human will." --B.H. Liddell Hart[11]

There has always been controversy over how best to utilize the obvious power of aircraft in warfare. Promises have been made that nations could be brought to their knees by employing strategic air strikes against enemy centers of gravity. History has borne out that there have been a few flaws with these theories. In an article for Aerospace Power Journal, Colonel Phillip Meilinger states that "Few people question the ability of airpower to be decisive at the tactical and operational levels of war. The issue of its effectiveness at the strategic level of war, however, is a different matter."[12] With that in mind however, current Air Force doctrine still holds that "…strategic attack is the most efficient means of employing air and space power."[13] So why then do incidents such as the bombing of the al Firdos bunker continue to draw this assumption into question? The answer is complexity--the complexity of predicting personal, social, and cultural reactions to specific precision attacks. Philosophers, psychologists, and sociologists have struggled for centuries to understand why people and groups react as they do to certain stimulus. Lieutenant Colonel Sakulich presented a simple model in his paper written for the Air War College's Center for Strategy and Technology titled "Precision Engagement at the Strategic Level of War," that depicts a 'black box' change mechanism that helps conceptualize the complexities of predicting the indirect effects of a precision strike.

Black Box Model

This model showing the 'black box' linking cause to effect[14] begins to truly uncover the magnitude of a commander's task when trying to use precision engagement to achieve discriminate, strategic effects. In some cases, military experts will have a good understanding of the depicted 'black box.' For example, the usual first-order effect of a precision strike is

destruction of the target, which is fairly easy to predict since we understand how high explosives should affect a concrete bunker. However, when the 'black box' becomes the mechanism explaining the enemy commander's or public's reaction to the strike, there is much we don't understand. Air Force Doctrine Document 2-1 summarizes the problem succinctly, "Failure to properly analyze the mechanism that ties tactical results to strategic effects has historically been the shortcoming of both airpower theorists and strategists."[15] While insightful and accurate, this statement implies that we either now have, or realistically soon will possess the ability to 'peer into the box.' For in order to realize the promise of reliable strategic effects utilizing precision engagement, operational commanders and planners must comprehend the workings of the change mechanism for each and every target in order to consistently predict multiple-order effects. This is a monumental assumption considering the staggering complexity of the enemy's sociological, cultural, and economic systems. Sociologists have trouble predicting the behavior of groups with well-understood value systems. To assume that a military planner can predict similar reactions for an unfamiliar population is beyond reasonable. It can be realistically assumed that many, if not most, future conflicts will arise in the 'arc of instability';[16] regions with cultures and values that differ, sometimes radically, from our own. Before putting too much stock in our ability to understand the strategic implications of precision strikes, consider that six decades after the most studied war in history, we are just now beginning to put

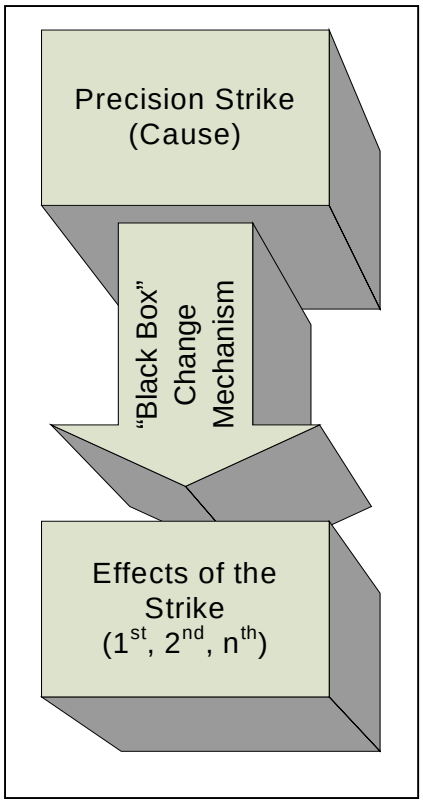

Figure 1: 'Black Box' Model Linking Cause and Effect

together a reasonably complete picture of the interactions of senior Japanese military and government leaders in World War II.[17]

We Can't Have it Both Ways

To fully understand the entire spectrum of indirect effects requires we understand the change mechanisms that turn cause into effect; something that has historically eluded us and shows no sign of being any more transparent in the near future. As Lieutenant Colonel Sakulich puts it in his paper, the proponents of precision engagement want to have it both ways. On the one hand they want to generate a battlespace that is non-linear, high-tempo, and complex for the enemy to react to, but at the same time assuming that we will have access to a relatively simple, static, linear battlespace when analyzing the enemy.[18] The question becomes, has our ability to predict what triggers specific outcomes kept up with our ability to strike targets precisely? Assuming the answer to that question is 'no,' then the follow-on question becomes; are we willing to accept the risks associated with multiple-order effects that we may not fully understand? This is the question which must be answered 'yes' every time we intend to use precision weapons to generate effects beyond the tactical level; and we had better be right, as the al Firdos bunker situation highlights.

Problem #2: The Paradox of 'Too Much Success'

In most cases we hail the development of a new military technology as a wonderful thing that will undoubtedly reshape how we interact with the battlespace. The development of precision weapons is generally viewed in exactly this light. However, like many things that seem 'too good to be true,' the employment of precision weapons has shown a downside to balance their positive effects. A side-effect of precision engagement is that it has created its own rules for employment, which paradoxically, can limit its flexibility. This becomes most pronounced

when seeking strategic, or indirect, effects since it is in these situations we are likely to encounter the most politically constraining rules of engagement.

The Imperative to Use Precision Weapons

In today's strategic climate, the limitation of collateral damage is at *least* as important as precision engagement's ability to locate, strike, and kill targets with a near-1:1 weapon to target ratio. As a result of what could be called a 'CNN effect,' the use of precision weapons has increasingly become expected, not just desired, by most Western societies. The standard for collateral damage has essentially become zero, as evidenced in spades in the al Firdos bunker scenario. In short, precision engagement has suffered from too much success, and has unwittingly redefined its own rules for employment. In situations where targeteers might have previously been able to employ a number of cheaper or more readily available weapons, they are now expected to use a precision weapon. These new rules of engagement frequently--and paradoxically--lead to a loss of flexibility for operational commanders. This loss of flexibility is further complicated since we can rest assured that this knowledge will not be lost on our future adversaries. As Dennis Reimer points out in his article, "Dominant Maneuver and Precision Engagement," we have become predictable in our "…infatuation with precision strike…."[19] If commanders like flexibility, then predictability is the yin to the yang. These commanders need to remember that the further up the tactical to strategic spectrum they elect to employ precision engagement; the more these limitations can affect the outcome.

Zero Collateral Damage: The New Unstated Standard

This emerging standard of zero-collateral damage has arisen largely in a completely unstated manner. It isn't written down anywhere, but certainly our new precision capabilities have forced us to redefine how we think of the principles of necessity and proportionality. The

extraordinary lengths our military takes to avoid *all* collateral damage has made our senior leaders believe that perhaps zero is a realistic, attainable goal. However, our theoretical capability to reach zero innocent casualties has lead to a new problem with the employment of precision engagement; "gratification without commitment."[20]

Problem #3: The "Tacticization of Strategy"

"We needed to know what was inside of the trucks. When we could not find out, we stop bombing trucks. We needed to know what was inside the buildings. When we couldn't find out, we stop bombing buildings. We needed to know what was under the camouflage net. When we couldn't find out, we stop bombing the camouflage nets." --General Wesley Clark, Commander in Chief, U.S. European Command during Operational Allied Force[21]

In the most recent edition of Masters of War, Michael Handel introduces a concept he calls the 'Tacticization of Strategy,' which he loosely defines as allowing lower-level considerations to define strategy in war.[22] He asserts that high-technology warfare, specifically the air war, is more susceptible to this phenomenon than other, more traditional forms of war.[23] This paper asserts that precision engagement is even more likely to be 'tacticized' than more traditional forms of air warfare. This problem only exists in the context of indirect effects since the 'tacticization of strategy' is a problem of tactical capabilities driving political strategy.

'Tacticization' Leads to Strategic Control of Tactical Assets

The same options that precision engagement has offered to operational commanders have not gone unnoticed at the strategic level. The promise of quick and cheap accomplishment of strategic objectives in politically complex environments will continue to tempt senior decision makers[24]. The military, and specifically the Air Force, tend to advertise our ability to reliably achieve strategic results, further tempting senior leaders to reach out and 'touch' enemy centers of gravity at low cost and risk, where previously they would not have been able. But these same senior leaders can also be extremely tempted to directly control the targeting process in politically charged climates rather than to give a targeteer the opportunity to select the wrong

target at the wrong time and generate a 'CNN event' which could jeopardize the entire objective (reference the al Firdos bunker again). No other form of warfare offers senior leaders this control, speed, and accuracy; making precision strikes a highly enticing option, especially when pursuing limited objectives in a short time. In openly declared, high-intensity warfare with fewer political limitations or sensitivities, senior civilian and military leaders are usually content to trust the details of the conduct of hostilities to their operational commanders. This of course is the basis of operational art; which by definition is meant to bridge the gap between strategic guidance and tactical taskings.[25] But when strategic-level commanders start selecting targets and methods of employment based on capabilities, the operational level of war is completely bypassed; there is now a direct link between the strategic and tactical levels. Obviously political limitations will always play a paramount role in war, but just as operational commanders must learn to accept these political constraints, strategic leaders need to allow operational commanders to employ operational art. If the nature of the objective is so politically sensitive that it cannot be trusted to operational planners, then senior leaders should make some tough decisions; either accept the possible costs of effective precision engagement, use a different instrument of national policy, change the political nature of the conflict somehow, or don't get involved in the first place. The hairs on the back of any operational planner's neck should stand up anytime a specific precision platform is directed from a higher headquarters--this should be a warning of the 'Tacticization of Strategy.'

Lessons Learned?

For those who believe that we learned our lessons from Vietnam regarding senior decision makers directly involved in the tactics of war, a quick look at the air war over Kosovo in 1997 highlights the realities and dangers of the 'tacticization of strategy.' In his book, The

Transformation of American Air Power, Benjamin Lambeth writes, "Any targets even remotely considered to be politically sensitive were reviewed personally at the White House by President Clinton, Secretary of Defense Cohen, and General Shelton." He goes on to state that in many cases, these same leaders were altering weapons loadouts as well, frequently substituting smaller bombs in place of larger ones.[26] This kind of high-level tactical intervention undermined the effectiveness and extended the duration of the campaign. What was originally planned to be settled "very quickly," ended up taking 78 days.[27] Kosovo is a perfect example of the allure of using precision engagement in situations that would previously not allow for the use of military options; situations that are so politically constrained that they must be controlled at the strategic level. This completely negates the well-established process of operational art in bridging the gap between strategy and tactics.

Will Information Technology be the Enabler of Reliable Indirect Effects with Precision Engagement?

"There is no universally accepted paradigm for strategic or indirect effects. There is no accepted predictive model." -- AFDCH 10-01[28]

In our post-Cold War, internet-dominated world, Western society has increasingly come to believe that technology can provide a solution to most of our problems. The military is no different than the rest of society, and we too seem to feel future technology is going to make the battlespace easier to manage. Buzzwords like transparency, asymmetrical force, parallel operations, and net-centric warfare, are commonplace in nearly all current technical and editorial writings. So will net-centric information systems allow us to overcome the inherent problems of using precision engagement for indirect effect? In the foreseeable future, the answer is 'no'; meaning that if we continue to pursue indirect, strategic-level effects with the use of precision weapons, we will have to continue to deal with all three problems previously discussed.

Information Technology and Predicting Human Behavior

As mentioned earlier, the complexity of predicting individual or group reactions to given events is monumentally difficult to achieve with any consistency. However, perhaps by fusing worldwide sources of expertise together in a collaborative planning environment with access to a database of all relevant information, we could achieve some useful success in predicting multiple orders of effects of precision strikes. Of course all of this would have to be done real-time, in very short timeframes, and around-the-clock during hostilities. If we assume we have all the leading experts we would need, and we assume they have access to a completely transparent battlespace with no deceptions, then could we predict all of the follow-on effects of a precision strike with a reasonable degree of accuracy? There is currently no known system capable of modeling this kind of behavior; military or civilian. In fact, in a recent article relating military information systems to those found in large businesses[29], Michael Schrage points out that, "Even elite net-centric organizations cannot reliably count on information superiority to generate superior results; frequently they can't even count on information superiority to prevent catastrophic losses."[30] The ability to understand and predict human reactions to particular precision strikes is more art than science. The ability to collect and present additional relevant information will undoubtedly continue to help operational planners make better judgments regarding if, when, and how to use indirect effects; but, as Clausewitz stated, action and outcome have a complex relationship, and luck does matter.[31]

Information Technology and Zero Collateral Damage

Perhaps one area that information technology *can* impact the utility of precision engagement is by reducing the chances of collateral damage. While this will not change the requirement to employ precision weapons in most foreseeable operations, it does help achieve the prerequisite

of this need, which is zero collateral damage. Our ability to collect, store, and process technical data relating to targets around the globe is enabling even greater results from precision engagement. An excellent example of this is the Joint Warfare Analysis Center in Dahlgren, Virginia, which can provide tremendous detail to help targeteers avoid collateral damage when attempting to strike particularly difficult targets.[32] However, as long as there are humans in the process of selecting and striking targets, errors will be made, exactly like they were at the al Firdos bunker. Despite the fact that the bunker was probably a legal military target, intelligence sources never detected the presence of civilians at the site;[33] a crucial piece of information in selecting the target for strike. "The marriage of information and precision dramatically elevates performance expectations."[34] This is the basis of zero tolerance for collateral damage. When human errors do occur, our increasing transparency of the battlefield will make it very easy for our friends and enemies alike to exploit these errors for their own ends. To further challenge the situation, we must ask how our own forces will react to this increasingly high standard for perfection; knowing that our net-centric systems will be collecting data on every decision and action. The very knowledge that we are always being watched, and frequently second-guessed when human mistakes do occur, will undoubtedly affect our own behavior. As Schrage asks, "Do [soldiers] become more conservative or would they err on the side of aggressiveness?"[35] Neither situation is desirable, but both are possible with near-complete accountability. Hence, the two edges of accountability; a good thing to ensure expected levels of performance, but something that can lead to negative side effects if carried too far; something that will be very tempting to do in a technology-dominated battlespace.

Information Technology and the 'Tacticization of Strategy'

The effect of information technology on the 'tacticization of strategy' is a topic for an entire dissertation in itself, but it is generally accepted that in a more net-centric culture, the availability of information to more people will make decentralization of decision making a natural effect. Technology-intensive, net-centric infrastructures make it just as easy to decentralize command as to centralize it.[36] This of course is contrary to the traditional centralized military command structure. When senior leaders are no longer dependant on lower echelons to provide synthesized information, it will be much simpler to make more decisions at higher levels. Futuristic views of net-centric warfare envision systems where the Joint Forces Commander has all the data from the entire battlespace at his fingertips. Certainly if he were to have access to this kind of information, commanders and leaders at the strategic level would have the same access if they desired; clearly a capability to run the tactical war from the strategic level. Rather than pass judgment on the viability and merits of net-centric warfare, this discussion is intended to point out that more information in more hands will only complicate the problem of the 'tacticization of strategy,' not make it easier.

Information Technology is Not a Silver Bullet

It should be clear that information technology is not the 'silver bullet' that will enable a 'magic bullet' in the form of reliable, indirect effects at the strategic level of war. This is not to say that current and future technology and information systems have not, and will not continue to provide tremendous advantages to our military forces. Clearly, information and technology are tremendously powerful force multipliers when understood and used properly. However, this does not mean we can extrapolate these positive effects and assume, by somehow simply collecting more information and networking it together, the limitations of precision engagement

will somehow evaporate. Even if perfect information was an achievable goal, Schrage once again provides an excellent synopsis of its value; "Even with…perfect 20/20 hindsight, many of the world's most important military decisions still do not lend themselves to rational analysis and concrete answers to the situations examined."[37]

Effects-based Operations and Indirect Effects

"Effects-based thinking is the critical enabler for emerging new capabilities such as precision guidance, networked ISR systems and stealth" --Joint Advanced Warfighter Program report, "New Perspectives on Effects-Based Operations"[38]

So if information technology isn't the enabler of indirect effects, are we then required to relegate precision engagement to purely tactical action; relying only on predictable first-order effects? While still a powerful force multiplier even in this role, there is still great utility in trying to influence the operational and strategic levels of war with indirect precision engagement, despite its limitations and problems. At the operational level of war, an excellent way to balance the inherent strengths of precision engagement with its weaknesses is by employing effects-based targeting or effects-based operations (EBO). EBO essentially attempts to concentrate combat power, in this case precision weapons, on a desired *effect* rather than a specific *target*. For example, we don't destroy tanks with Hellfire missiles just because they are there; we destroy them to allow our ground forces to move through or occupy an area of the battlespace with little or no opposition. EBO is essentially the operational-level equivalent of a strategic desired end state. It is not unique to precision engagement, nor is it a new concept. Warfare has always sought to achieve particular effects, but the emphasis has frequently been on the destruction of enemy forces since this was the perceived means to achieve the desired effects. EBO is simply the re-emphasis of the desired effect rather than the mere destruction of forces and platforms. The American submarine campaign against Japanese shipping in the Western Pacific during World War II is an excellent example of EBO, even if it wasn't called that at the time. Certainly

the tactical impact of destroying merchant ships was negligible at best, but it is almost impossible to overstate the effects the subsequent shortage of supplies and petroleum products had on limiting Japanese plans as the war progressed.[39] This is a classic case of targeting EBO in such a way as to limit enemy options. While the destruction of the merchant shipping undoubtedly had some impact on the will of Japanese leaders, the primary intended effect was to restrict the amount of goods reaching the home island and troops deployed in the theater. This distinction is important, and lies at the very heart of the operational art of precision engagement.

Using Effects-Based Operations to Foreclose Enemy Options

Standing in stark contrast to the use of EBO in the Pacific submarine campaign, are the bombings which took place on the nights of the 9th and 10th of March, 1945. On those nights, more than 300 B-29 "Superfortresses" bombed Tokyo with incendiary bombs, destroying nearly 16 square miles of the city and killing 80,000 to 100,000 people; almost all civilians.[40] While this can be considered EBO, the intent of these attacks was very different. The submarine campaign primarily served to limit enemy options or courses of action, while the terror bombings intended to directly impact the will of the Japanese people and leadership. AFDCH 10-01 identifies four coercion mechanisms in effects-based operations: punishment, risk, denial, and decapitation. It further correctly states that historically, denial has been the most effective form or coercion.[41] The problem with the other three mechanisms is they rely on understanding enemy motivations. As Donald Chisholm points out in his article, "The Risk of Optimism in the Conduct of War," the problem with attempting to understand or modify enemy motivations is that they are latent variables that cannot be directly observed. He further adds that "Developing measures of effectiveness that will allow us to know whether we are actually achieving our intended manipulation and degradation of enemy intention and will is likely to never be more than

partially successful."[42] "New Perspectives on Effects-Based Operations," a study conducted by the Joint Advanced Warfighter Program, had this to say about attempting to alter enemy will or aims: "…the advocates of [nodal targeting of critical target sets] often articulate a belief that one can identify critical nodes, and thus critical target sets, which, when struck, will cause the enemy's actions to conform to US aims." The study goes on to say that "…it is not likely that US forces will be able to realize total success in pursuing such a notion."[43] Lieutenant Colonel Sakulich cites a draft of this study when he comes to this same conclusion; that effects-based approaches can foreclose enemy options more reliably than attempting to compel specific predetermined behavior.[44] In this regard, he appears to provide a much more realistic approach to the use of precision weapons over attempting to direct enemy will. All of this supports the fact that precision engagement is best used to foreclose enemy courses of action, be that through predictable first-order effects, or the progressively less reliable second and third order effects.

Don't Put All Your Eggs in One Basket

But it would be imprudent of any commander to completely dismiss any option available to him, and there are times when indirect attacks at an enemy's will may compliment other tactics such as limiting enemy options. The history of using indirect effects to compel enemy will has met with very mixed results. While it is true that the exploding of the world's first two atomic weapons *did* force Japan to finally surrender, the strategic bombing offensive by the Eighth Air Force over Germany never did break the will of Germany's leadership (but it did have at least some effects on limiting enemy courses of action). The jury appears to still be out on the effects of precision engagement in forcing Slobodon Milosivich to cease his ethnic cleansing in Kosovo. Both direct and indirect effects play important roles for the operational commander, but he needs to understand which are which, and what the risks of indirect effects can be.

Effects-Based Operations: Still Much Work to be Done

As mentioned previously, EBO is certainly not a new concept, but neither is it a mature model. The idea of effectively employing precision engagement using EBO is no simple matter. In fact, a recent study done by the Joint Advanced Warfighter Program specifically looking at the history and future of EBO points out that we have only scratched the surface to be able to properly conceptualize and employ EBO. It states that "More work remains to make the concepts of…[EBO]…useful to current and future joint force commanders and staffs."[45] It should also be noted that EBO is not by any means unique to precision engagement, nor should it be used in that way. EBO, to be properly realized, is a complete conceptual system linking every aspect of planning and preparation. However, as evidenced above, once properly understood and implemented, EBO offers the right tools for operational commanders to effectively use all the advantages of precision engagement, while minimizing its drawbacks.

Conclusion

"Precision engagement significantly contributes to successful operations. However it cannot fully dominate battlespace across the conflict spectrum by itself." --Dennis Reimer[46]

While precision engagement has created many tactical options, there is no 'automatic bridge' to connect the tactical level to the operational or strategic level of war. The problem of the unpredictability of indirect effects is what ensures that this link does not exist. If we understood all of the repercussions of a precision attack, one could perhaps begin to argue that higher-level objectives could be met directly. Until the day we achieve this perfect understanding, we will have to rely on operational art to be the 'bridge' linking precision engagement to the operational and strategic levels. However, as we have also seen, precision engagement can be very susceptible to the 'tacticization of strategy,' which leads to bypassing operational art and thus jeopardizing precision engagement's ability to generate reliable strategic effects. To cap both of

the other problems is the dilemma that precision engagement has suffered from its own success. Even if we could conduct a campaign with 'dumb' weapons while still honoring the principles of necessity, economy of force, and proportionality, Western society has come to expect zero casualties as the standard to achieve. This can paradoxically reduce planning options since precision capabilities are both expensive and in short supply.

Finding a way to overcome these problems is also a part of operational art. For an operational commander to assume that information systems will provide some kind of solution is like waiting for lightning to strike. No amount of information can realistically be expected to ever accurately predict human reactions, emotions and resolve; all of which are vital when seeking higher-levels of indirect effects. Making more information available to decision makers can actually exacerbate the other two problems of collateral damage intolerance and senior leaders attempting to bypass the operational level and directly run the tactical war.

The best way to 'operationalize' precision engagement and minimize its drawbacks is by understanding that it is inherently still a tactical weapon and must be employed properly, and at times carefully, if we want to generate results that have an impact on the operational and strategic levels of war. Effects-based operations offer the right 'look' at how to employ precision weapons, especially when we use EBO to limit the options available to the enemy. Indirect attacks at an enemy's will or resolve are possible, but have historically proven unreliable. Nonetheless, operational commanders may find those kinds of attacks work well to compliment more centrally focused denial attacks.

The proper use of precision engagement is the quintessential forum for the application of operational art. Without soundly applied operational art, precision engagement becomes only so many complex and expensive weapon systems flying about in search of a purpose. While that may look good on CNN, it's no way to win a war.

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Notes

[1] "The Battle of Hearts and Minds – Vignette 8." WashingtonPost.com. <http://www.washingtonpost.com/wp-srv/inatl/longterm/fogofwar/vignettes/v8.htm/> [25 January 2004]
[2] Moran, Michael. "Gulf War Lessons, Learned or Not." MSNBC.com <http://www.msnbc.msn.com/default.aspx?id=3071782&p1=01%7c%7c%7c%7c004/ [25 January 2004]
[3] Ibid.
[4] "The Battle of Hearts and Minds – Vignette 8."
[5] Ibid.
[6] The definitions and concepts of direct and indirect effects are provided in AFDCH 10-01, which itself makes reference to AFDD 2-1. Air Force Doctrine Center, Air and Space Commander's Handbook for the JFACC, AFDCH 10-01 (Maxwell Air Force Base, AL: 16 Jan 2003), pp 64-65.
[7] This is a paraphrased definition of direct effects taken from AFDD 2-1, however that document does not specifically mention how physical results relate to direct effects. Air Force Doctrine Center, Air Warfare, Air Force Doctrine Document 2-1 (Maxwell Air Force Base, AL: 22 January 2000), p 106.
[8] Ibid, p 66.
[9] AFDD 1 states that, "The inherent strategic application of air and space forces must be balanced against their ability to conduct operations at all levels of war, often simultaneously." Air Force Doctrine Center, Air Force Basic Doctrine, Air Force Doctrine Document 1 (Maxwell Air Force Base, AL: September 1997), p 27.
[10] The use of this term is taken from Appendix E, "The Problem of the Level of Analysis and the 'Tacticization of Strategy'" in Michael Handel's book, Masters of War. Handel, Michael I. Masters of War: Classical Strategic Thought. Third, Revised and Expanded Edition, (London: Frank Cass Publishers, 2001), pp 353-360.
[11] B.H. Liddell Hart, Quoted in Sakulich, Timothy J. "Precision Engagement at the Strategic Level of War: Guiding Promise for Wishful Thinking." Occasional Paper Number 25, (Maxwell AFB, AL: Center for Strategy and Technology, Air War College, Air University), p 19.
[12] Meilinger, Phillip S. "Air Strategy: Targeting for Effect." Aerospace Power Journal. (Volume XIII, Number 4, Winter 1999. Linked: http://www.airpower.maxwell.af.mil /airchronicles/apj/apj99/win99/win99.htm, 2 February 2004), p 60.
[13] AFDD 1, p 52.
[14] Ibid, p 9.
[15] AFDD 2-1, (22 January 2000), p 11.
[16] Chisholm, Donald. "The Risk of Optimism in the Conduct of War." Parameters, (Winter 2003-2004): p 125.
[17] Chisolm, pp 118-119.
[18] Sakulich, p 23.
[19] Reimer, Dennis J. "Dominant Maneuver and Precision Engagement." (Joint Forces Quarterly, Winter 1996-97): p 16.
[20] The author makes reference to this quote in explaining how political leaders have come to allow the capabilities of precision strikes to drive strategy decisions. Cohen, Elliot A., quoted in Lambeth, Benjamin S. The Transformation of American Air Power, (Cornell University Press, 2000), p 232.
[21] General Wesley Clark, quoted in Sakulich, p 15.
[22] Handel, p 355.
[23] Ibid, p 360.
[24] Ibid.
[25] U.S. Joint Chiefs of Staff. Doctrine for Joint Operations. Joint Publication 3-0 (Washington, D.C.: 10 September 2001), GL-14.
[26] Lambeth, p 204.
[27] Ibid, p 183.
[28] AFDCH 10-01, p 61.
[29] While the correlation between commercial businesses and military operations in war is not exact, there are more similarities than differences. Michael Schrage make a comparison between military organizations and investment fund management organizations; "Both groups engage in ongoing risk assessment. Both observe highly regulated 'rules of engagement' subject to legal oversight. Digital technology is used to track decisions as well as facilitate them. Both groups 'take positions' where the services have 'doctrine,' hedge funds have 'investment philosophies.' Both rely heavily on timely 'intelligence' while confronting deception and

disinformation. Both groups coordinate international coalitions and joint operations. Bold leadership, individual initiative and discipline are culturally celebrated core values. Character and esprit de corps matter." Schrage, Michael. "Perfect Information and Perverse Incentives: Costs and Consequences of Transformation and Transparency." (Cambridge, MA: Massachusetts Institute of Technology Security Studies Program, 2003), p 3.

[30] Ibid, p 5.

[31] The paraphrased quote of Clausewitz is taken from an IDA/JAWP study titled, "New Perspectives on Effects-Based Operations: Annotated Briefing" and is not intended to be a direct quotation from his book On War, but rather a summation of some of his theories of war. Clausewitz, Karl von, quoted in Institute for Defense Analysis, Joint Advanced Warfighting Program. "New Perspectives on Effects-Based Operations: Annotated Briefing." (Alexandria, VA: June 2001), p 34.

[32] Sakulich, p 22.

[33] "The Battle of Hearts and Minds – Vignette 8"

[34] Schrage, p 11.

[35] Ibid.

[36] Ibid, p 8.

[37] Ibid, p 14.

[38] "New Perspectives on Effects-Based Operations: Annotated Briefing," p 5.

[39] Chisholm, p 127.

[40] Ibid, p 122.

[41] AFDCH 10-01, pp 63-64.

[42] Chisholm, p 118.

[43] "New Perspectives on Effects-Based Operations: Annotated Briefing", p 13.

[44] Sakulich, p iv.

[45] "New Perspectives on Effects-Based Operations: Annotated Briefing", p 48.

[46] This quote is taken from Dennis Reimer's article in Joint Forces Quarterly, "Dominant Maneuver and Precision Engagement" and summarizes his view for the need for a balance between the two factors. Reimer, p. 14.