EBO
There Was No Baby *in* the Bathwater
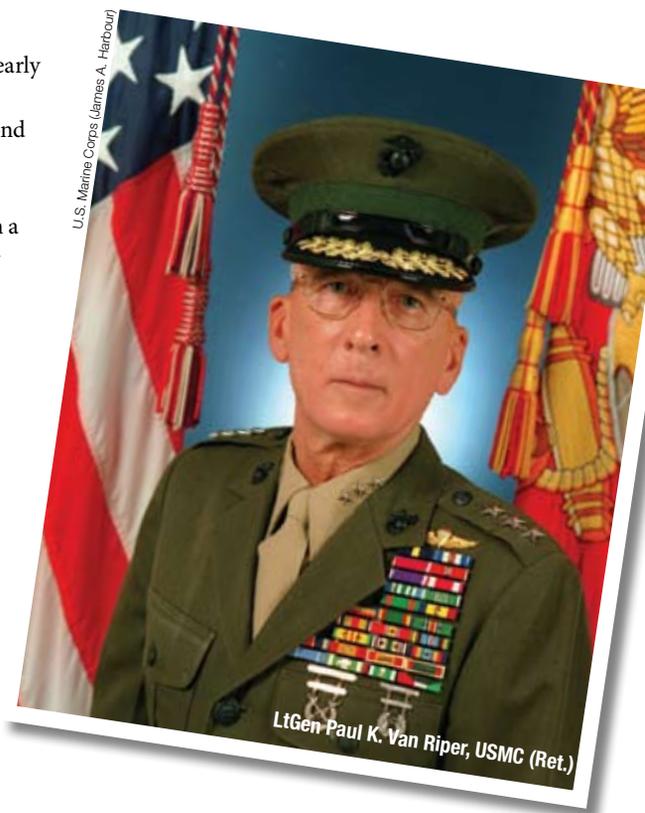
By PAUL K. VAN RIPER

We should not be surprised that one of our most combat-seasoned and professionally informed leaders, General James Mattis, USMC, who commands U.S. Joint Forces Command (USJFCOM), recently issued a memorandum that calls for an end to the effects-based operations (EBO) nonsense that has permeated much of the American defense community for the past 6 years. Nor should we be surprised that other leaders with similar operational experience promptly applauded General Mattis' actions. They all saw effects-based operations as a vacuous concept that has slowly but surely undermined professional military thought and operational planning. One can only hope that the general's action, coupled with a similar effort by U.S. Army Training and Doctrine Command in 2007, will halt the U.S. military's decade-and-a-half decline in conceptual thinking.[1]

Which EBO?

To understand the EBO mania that has distracted our defense establishment for far too long, we first must understand the differences between three varieties. The first variety of effects-based operations stems directly from the efforts of two exceptional Air Force officers, Colonel John Warden and then Lieu-tenant Colonel David Deptula. In the early days of Operation *Desert Shield*, both officers pushed planners to move beyond the narrow focus of "joint munitions effectiveness manuals" (JMEMs) that describe only the *effects* expected from a particular weapon against a particular type of target. Warden and Deptula quite correctly demanded that targeting officers expand their horizons and determine how best to attack systems rather than single targets.[2] For instance, they might have asked a targeting officer to ascertain the best way to knock out a surface-to-air-missile battery without destroying every launcher or to degrade an electrical power grid without putting it out of action for years. To secure the results sought, Warden and Deptula focused the *effect* they desired on a system rather than simply listing targets for pilots to destroy.[3]

This is a logical and productive way to develop targeting plans, an approach we should applaud. Warden and Deptula, however, could have just as easily used other words to express the same idea. As examples, they might have labeled it as *outcome-based*, *result-based*, *impact-based*, *purpose-based*,

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or *intent-based operations* without losing any of the value inherent in the approach. If the two officers had used either of the latter two terms, they would have acknowledged that they understood the essence of *mission-oriented command*.[4] Though any observer reviewing recent conceptual thought in the U.S. defense community would hardly know it, there is nothing magical or unique about the word *effect*. Fundamentally, Warden and Deptula were working to ensure that everyone involved in planning and executing an operation understood *why* they sought to achieve certain *ends*.

Despite its utility, this variety of effects-based operations is only effective with manmade systems that have an identifiable and tightly coupled structure, such as integrated air defenses, distribution networks, and transportation complexes. The method has little utility against dynamic systems such as economies and social groups whose elements are only loosely coupled and with relationships that are frequently unclear. Nonetheless, some proponents went on to claim that what began as an effects-based targeting method should extend to operations as a whole and even to war.[5] That this suggestion survived and was widely promulgated is sad testimony to the fact that many military officers have

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little understanding of how interactively complex systems work.[6]

The second variety of effects-based operations stems from the U.S. Army's renaming of the fire support coordination center as the effects coordination cell and fire support coordinator as the effects coordinator. The Army wanted to stress that beyond coordinating the maneuver of units with supporting fires, operations officers and fire support officers needed to consider other means and methods such as psychological operations, deception operations, electronic warfare, and so forth, and to coordinate them with maneuver and fires. This was not a new idea; the requirement for this type of coordination

has been part of doctrine since the Korean War.[7] Every competent operations officer and fire support coordinator recognizes his responsibility to orchestrate all means and methods effectively and efficiently. Regrettably, many joint forces soon picked up on the new name, and *effects coordination cells* became the prevalent term. Things became even more muddled when the expanded and flawed version of Warden and Deptula's effects-based operations found its way into the effects coordination cells of operational units. Eventually, the Army recognized more was lost than gained by its renaming effort, and in early 2007, the Army directed a return to the original terms of fire support coordination center and fire support coordinator.[8] We can only hope that the joint community makes the same decision soon.

The third variety of effects-based operations originated in the USJFCOM J9 directorate in late 2000. It is the most egregious of the three varieties and the one that has most damaged operational thinking within the U.S. military. In essence, concept developers in the J9 asserted that through detailed study of an enemy's systems—identified as political, military, economic, social, infrastructure, and information (PMESII)—planners could determine what effects they might achieve by taking various actions against specific links and nodes in those systems. Furthermore, they claimed that the practice would allow planners to determine how the effects of actions on one system would affect one or more of the other systems. They argued that the United States could use diplomatic, informational, military, and economic (DIME) tools to carry out these actions; hence, the often-heard grating and acronym-laden statement that we would "employ our DIME against an enemy's PMESII to achieve desired effects." This claim supposedly was supported by a technique known as operational net assessment (ONA), "the tool that identifies the correct targets, links, and nodes that will create the desired effect."[9] Concept writers went on to state, "ONA aims to provide a thorough understanding of the total effect [on an adversary] and how to achieve it."[10]

Operational net assessment itself purportedly was accomplished through a procedure called system-of-systems analysis (SoSA), which "enables us to set environmental conditions to force the target to adapt and to choose only options that we make available."[11] If only military planning and combat operations

were conducted so easily. Experienced officers must wonder if the authors of these words are unaware of the hubris of such a declaration. In actuality, SoSA relies on the techniques of formal systems analysis. Vietnam War veterans quickly recognized SoSA as virtually identical to the analytical methods that Secretary of Defense Robert McNamara foisted upon the U.S. military in the 1960s with so many disastrous results.

USJFCOM proponents of effects-based operations appeared oblivious to the realities of interactively complex systems. These nonlinear systems are not ones in which the cause and effect are straightforward, but ones in which effects cascade throughout the system in unpredictable ways, causing the emergence of wholly unanticipated additional phenomena. Efforts to modify ecological systems have made scientists fully aware of the folly of attempting to affect such nonlinear systems through discrete actions. The nearly limitless ways that an action might ricochet through an interactively complex or nonlinear system mean that for all practical purposes, the interactions within the system exceed the calculative capacities of any computer to follow, at least in any meaningful way. The numbers are so large that even the most advanced computers would take billions of years to process them.[12] Yet within the J9, developers were undeterred as they built ever more elaborate procedures to carry out the so-called system-of-systems analysis. We might suspect that the contractors who wrote the software programs to support this fundamentally flawed idea were motivated more by the bottom line than the actual value of the capabilities delivered. In short, supporters of ONA and SoSA argue for a pseudoscientific approach to operational planning.

As the opponents of the USJFCOM version of effects-based operations marshaled their evidence, in particular the commanding generals and staffs of the U.S. Army Training and Doctrine Command and U.S. Marine Corps Combat Development Command, the J9 concept writers began to lower their sights, backing away from unsupportable claims. Rebuffed, they labored to salvage something

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from the concept.[13] To the dismay of many military professionals, promoters of cockamamie EBO concepts prevailed on writers of joint doctrine to include several of its key components in Joint Publication (JP) 3–0, *Joint Operations*, and JP 5–0, *Joint Operation Planning*. Most significant among the materials included are a distorted description of system theory, the flawed PMESII construct, and a new and puzzling description of the association of effects to objectives, missions, and tasks.

The description of systems in JP 3–0 and JP 5–0 is incoherent, as it mixes the attributes of structurally complex (linear) and interactively complex (nonlinear) systems, ascribing to both the notion of *nodes* that the joint force can "target," and *links* ("the behavioral or functional relationships between nodes") that the joint force can "cut."[14] In structurally complex systems, nodes and links exist and are relatively static; thus, forces can target and cut those that are identifiable. In interactively complex systems, the relationships between elements are constantly in flux, and links—as conceived of by EBO advocates—are often not apparent and are frequently transitory. Finding nodes to destroy and links to cut in a meaningful way in these kinds of systems is usually a fruitless undertaking. Moreover, even if a node is destroyed or a link cut, these systems are self-healing, allowing them to continue functioning with no apparent degradation. A cursory review of the vast literature on systems theory and nonlinear dynamics would have made the J9 concept writers aware of the invalid basis for their effects-based operations concept.

Figure IV–2 in JP 3–0 and figure III–2 in JP 5–0, both titled "The Interconnected Operational Environment," depict a Venn diagram with six overlapping circles labeled *political*, *military*, *economic*, *social*, *information*, and *infrastructure* with a web of links and nodes within and among them.[15] This is the same diagram that EBO advocates used to illustrate SoSA, giving lie to the claim that this methodology is no longer part of the approach. JP 3–0 and JP 5–0 promulgate the EBO advocates' ill-conceived ideas minus only the names: ONA and SoSA.

Even more confusing is the use of the term *effects* in these two doctrinal manuals, defined as "a physical and/or behavioral state of a system that results from an action, a set of actions, or another effect."[16] In plainer English, effects are the results, outcomes, products,
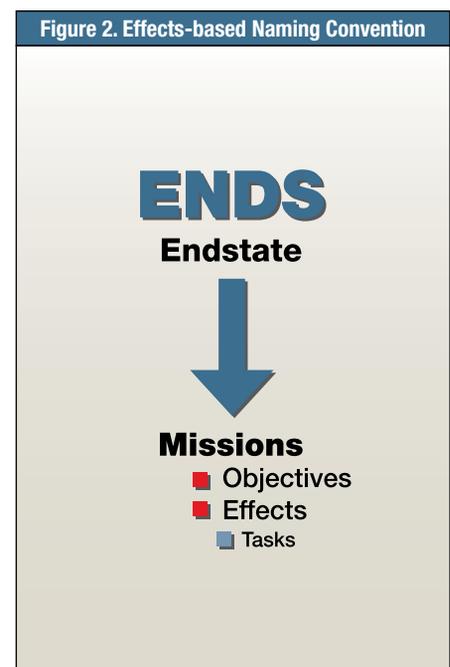
consequences, or perhaps impacts of actions undertaken by the joint force. Seldom in recent years have careful listeners heard any of these synonyms used in professional discussions—the effects nomenclature has become a mantra. Sadly, as a result, defense leaders in their writing and speech have voluntarily given up the nuances possible with various other terms. All but forgotten is the fact that all these terms simply identify the *ends* desired.

Operational concepts existing prior to the EBO craze were founded on Clausewitzian thought, especially the master theorist's recognition of the need to clearly identify desired *ends* and to tie them to available *means*. Clausewitz repeatedly called attention to the absolute necessity of connecting strategic and tactical ends to the higher aim or purpose. Over the past half-century or so, notable military thinkers such as B.H. Liddell Hart, J.C. Wylie, and Colin Gray have pointed repeatedly to the importance of the *ends-means* paradigm.

Ends are ends, plain and simple! What we title them may help or hinder their meaning and our understanding, but ultimately they remain ends. The longstanding naming convention for ends in the U.S. national security community has extended from *goals* to *objectives* to *missions*, with the latter's inherent *tasks* and associated *intents* (see figure 1). At the national level, ends are expressed most often as goals. To accomplish these goals, national leaders assign objectives to various organizations. Subordinate

objectives are nested under higher objectives as the expression of desired ends filters down through the chain of command. At some point, a leader assigns a military unit a mission designed to accomplish an objective. There appears to be no hard and fast rule as to when it is time to convert an objective to a mission, but most operational and tactical commanders expect to receive missions.

As described in the previous paragraph, with no worthy explanation as to the reason, the authors of JP 3–0 and JP 5–0 have added effects to the long-standing *ends* naming convention. Even more perplexing, missions, which have always consisted of tasks with associated intents, now include objectives and effects, while intents—the very heart of mission-type orders—are eliminated (see figure 2). The creators of this new and confusing naming convention never reveal its supposed advantage over the traditional one. Even more baffling, when these inventors provide examples of effects, they merely use the past tense of a verb that traditionally would be the task. For instance, an effect is "defeated Red's attack," which of course is completion of the task "to defeat Red's attack." Justifiably, any American taxpayer would cringe knowing that the U.S. military spent tens of millions of dollars between 2000 and 2007 to conclude that using the past tense of a verb in some mysterious way improves U.S. military planning and operations. Is there any doubt why so many skeptics rose to challenge this meaningless change to existing methods?

Figure 1. Traditional Naming Convention

ENDS
Goals
↓
Objectives
↓
Missions
■ Tasks
■ Intents

Figure 2. Effects-based Naming Convention

ENDS
Endstate
↓
Missions
■ Objectives
■ Effects
■ Tasks

What Have We Lost?

The intellectual renaissance spurred by the failures in the Vietnam War and led by Admiral Stansfield Turner, USN, General Donn Starry, USA, and General Al Gray, USMC, during the mid-1970s into the late 1980s produced a solid body of doctrine and a powerful but concise professional lexicon. This renaissance was built on a deep appreciation of history and a thorough understanding of war's fundamental nature. The operational concepts created during this period were founded on Clausewitzian thought, especially the master theorist's recognition of the need to clearly identify desired *ends* and to tie them to available *means*. Central to these concepts was the notion that telling a commander the reason—or *why* he was to accomplish an assigned task—was imperative if he was to take the initiative when circumstances at the scene of action changed. Foremost, he was

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to understand that the purpose or intent of a task is always more important than the task itself. In essence, the achievements at the many points of contact with an enemy are the culmination of *ends* that have traveled from national *goals* through several echelons of command *objectives* to a hierarchy of unit *missions* with their integral *tasks* and *intents*. Again, see figure 1.

The USJFCOM version of effects-based operations is a "non-idea" that survived far too long. Not only did it undermine well-founded conceptual ideas based on mission-oriented command, but it also confused the U.S. military's officer corps and diverted scarce resources and intellectual energies away from truly important issues, the most critical of which is studying insurgencies. The actual costs were significant; the opportunity costs were enormous. General Mattis and the many senior officers in his corner—all tested in the crucible of battle—have done our nation a great service, righting an intellectual vessel that was on its way to drowning real

professional thought in the U.S. military and the wider defense community.[17] They deserve our thanks!

With the effects-based operations distraction now behind them, U.S. military officers can turn their attention to resolving real conceptual and operational challenges rather than miring themselves in unsound premises aimed at manufactured problems. More importantly, they can once again effectively employ the simple elegance of mission-oriented command as they face our nation's enemies. **JFQ**

NOTES

[1] Combined Arms Directorate, U.S. Army Combined Arms Center, "Army Doctrine Update," memorandum, February 24, 2007.

[2] Williamson Murray, *Air War in the Persian Gulf* (Baltimore: The Nautical & Aviation Publishing Company of America, 1995), 16.

[3] There is anecdotal evidence that Colonel Warden may have borrowed the idea of focusing on individual targets from the Warfare Analysis Department, Naval Surface Warfare Center, Dahlgren Division, which was a predecessor of the Joint Warfare Analysis Center.

[4] *Mission-oriented command* and *mission-type orders* were rediscovered by concept developers and doctrine writers in the 1980s and soon became a staple of Service and joint operational planning. I say *rediscovered* because we can easily trace this approach back to the 19th century and Helmuth von Moltke ("the Elder"). The central feature of mission-type orders is the requirement to relate each *task* in a mission statement to an overarching *purpose* or *intent*. For example, if a task contained in a mission statement is to "seize a bridge over a river," the intent might be "to prevent the enemy from moving south." The latter informs the commander assigned the task of seizing the bridge that he needs to be alert to other ways the enemy might cross the river—perhaps a nearby ford or barges—and to deny this use. Similarly, a commander tasked to capture an airfield would benefit if he knew that the purpose of that task was to enable the air-landing of additional forces, forewarning him to the necessity of avoiding excessive damage to runways and the control tower.

[5] As an example, see David A. Deptula, *Effects-Based Operations: Change in the Nature of Warfare* (Arlington, VA: Aerospace Education Foundation, 2001).

[6] For an excellent discussion of interactively complex systems, see Robert Jervis, *System Effects: Complexity in Political and Social Life* (Princeton: Princeton University Press, 1997).

[7] Jonathan B.A. Bailey, *Field Artillery and Firepower* (London: The Military Press, 1989), 270–271.

[8] Combined Arms Directorate.

[9] U.S. Joint Forces Command, *Concept Primer: Operational Net Assessment (ONA)* (Norfolk: U.S. Joint Forces Command, October 2003), 1.

[10] Ibid.

[11] Ibid.

[12] We can use the game of chess to explain the scope of the problem: A chess board has only 64 squares and 32 pieces. Players are limited by the rules of the game in the ways they can move the various pieces. Therefore, since the "system" is bounded, it seems possible, though perhaps difficult, to understand the many ways a game might unfold when one play is different in every game. Mathematicians estimate the number is 10^{128}. This is an extraordinarily large number, but how large is best illustrated by the following lesser number, 10^{80}, which is the number of atoms in the universe. By many orders of magnitude, there are more potential discrete games of chess than there are atoms in the universe. Consider then the challenge of determining how the effect created by an action might cascade through an economic system.

[13] Proponents began to draw back from the extremes of EBO formally when they renamed the concept the *effects-based approach*, disassociated the concept from ONA, and made other adjustments in the *Commander's Handbook for an Effects-Based Approach to Joint Operations*, dated February 24, 2006. The handbook introduced new organizations and procedures designed to allow for implementation of an effects-based approach. These procedures added steps and products to the planning process, making it overly cumbersome.

[14] Joint Publication (JP) 5–0, *Joint Operation Planning* (Washington, DC: Joint Chiefs of Staff, December 26, 2006), III–18.

[15] JP 3–0, *Joint Operations* (Washington, DC: Joint Chiefs of Staff, September 17, 2006), IV–5; and JP 5–0, III–17.

[16] JP 5–0, III–12.

[17] At the center of the EBO faction were far too many contract concept developers. Many had never experienced combat. More than a few had never worn the uniform. In a sense, the U.S. military—USJFCOM in particular—outsourced much of its intellectual activity for the good part of a decade with dire consequences.