

A Dual-edged Sword: Operational Risk and “Efficiency”-Based Operations (EBO)

A Monograph

by

**Lieutenant Colonel Daniel S. Roper
United States Army**



**School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas**

Academic Year 03-04

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MONOGRAPH APPROVAL

LTC Daniel S. Roper, USA

Title of Monograph: A Dual-edged Sword: Operational Risk and
“Efficiency”-Based Operations (EBO)

Approved by:

_____ Monograph Director

Peter J. Schifferle, Ph.D.

_____ Director

Col Kevin Benson

School of Advanced
Military Studies

_____ Director, Graduate Degree

Robert Baumann, Ph.D.

Program

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Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE

26 MAY 2004

2. REPORT TYPE

3. DATES COVERED

-

4. TITLE AND SUBTITLE

Dual-edged sword: operational risk and "efficiency"-based operations (EBO)

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Daniel Roper

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

US Army School for Advanced Military Studies, 250 Gibbon Ave, Fort Leavenworth, KS, 66027

8. PERFORMING ORGANIZATION REPORT NUMBER

ATZL-SWV

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

In spite of experience that shows post-conflict stability operations are inevitable, the U.S. military places more emphasis on winning the fighting and less on the decisive post-combat phase. This has resulted in increased risk to the mission and the force. The U.S. has trained and equipped its military to defeat its enemies decisively on the battlefield and has done this so successfully that its enemies are changing the nature of that battlefield. Aware of the U.S. military's conventional overmatch, potential adversaries are likely to challenge the U.S. unconventionally or possibly after the cessation of combat operations to secure their political aims. This increases risk to the Joint Task force (JTF) and the accomplishment of strategic objectives. Effects-based operations (EBO) both can help and hinder the JTF's mitigation of operational risk during transition from combat to post combat operations. Effects-based thinking and operations have demonstrated their potential analytically, in joint warfighting experiments, and in combat. The obstacles that the U.S. military must overcome to realize the potential of EBO in the mitigation of operational risk during post combat operations are surmountable. These challenges are a mindset and corresponding doctrinal emphasis on combat operations at the expense of post combat operations, over-reliance on the efficiency of new warfighting concepts without full recognition of the limitations in their effectiveness, a targeting mentality that does not focus adequately on man and his behavior, and the inadequacy of assessment processes to support the pace of operational execution. The U.S. military should take several initiatives to enhance the JTF's ability to mitigate risk during transition from combat to post combat operations using EBO. Some of these proposals require actions internal to the JTF; others require support from the Department of Defense and the interagency; others still from academic, private-sector, non-governmental, and multinational organizations. These measures neither eliminate risk nor assure success, but all contribute to risk mitigation during transition to post combat operations. To realize the potential of EBO in the mitigation of operational risk during post combat operations, the U.S. military should reexamine its cultural bias toward fighting the large conventional battles for which it has trained, increase doctrinal emphasis on post combat operations, improve and enrich its cultural awareness, and develop an effects-based operational risk management process.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

ABSTRACT

A DUAL-EDGED SWORD: OPERATIONAL RISK AND “EFFICIENCY”-BASED OPERATIONS (EBO) by Lieutenant Colonel Daniel S. Roper, USA, 61 pages.

In spite of experience that shows post-conflict stability operations are inevitable, the U.S. military places more emphasis on winning the fighting and less on the decisive post-combat phase. This has resulted in increased risk to the mission and the force. The U.S. has trained and equipped its military to defeat its enemies decisively on the battlefield and has done this so successfully that its enemies are changing the nature of that battlefield. Aware of the U.S. military’s conventional overmatch, potential adversaries are likely to challenge the U.S. unconventionally or possibly after the cessation of combat operations to secure their political aims. This increases risk to the Joint Task force (JTF) and the accomplishment of strategic objectives.

Effects-based operations (EBO) both can help and hinder the JTF’s mitigation of operational risk during transition from combat to post combat operations. Effects-based thinking and operations have demonstrated their potential analytically, in joint warfighting experiments, and in combat. The obstacles that the U.S. military must overcome to realize the potential of EBO in the mitigation of operational risk during post combat operations are surmountable. These challenges are a mindset and corresponding doctrinal emphasis on combat operations at the expense of post combat operations, over-reliance on the efficiency of new warfighting concepts without full recognition of the limitations in their effectiveness, a targeting mentality that does not focus adequately on man and his behavior, and the inadequacy of assessment processes to support the pace of operational execution.

The U.S. military should take several initiatives to enhance the JTF’s ability to mitigate risk during transition from combat to post combat operations using EBO. Some of these proposals require actions internal to the JTF; others require support from the Department of Defense and the interagency; others still from academic, private-sector, non-governmental, and multinational organizations. These measures neither eliminate risk nor assure success, but all contribute to risk mitigation during transition to post combat operations. To realize the potential of EBO in the mitigation of operational risk during post combat operations, the U.S. military should reexamine its cultural bias toward fighting the large conventional battles for which it has trained, increase doctrinal emphasis on post combat operations, improve and enrich its cultural awareness, and develop an effects-based operational risk management process.

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EVOLVING CHALLENGES AND RISK FOR THE JTF

Action can never be based on anything firmer than instinct, a sensing of the truth. Nowhere, in consequence, are differences of opinion so acute as in war, and fresh opinions never cease to batter at one's convictions. No degree of calm can provide enough protection: new impressions are too powerful, too vivid, and always assault the emotions as well as the intellect.

Carl von Clausewitz, *On War*¹

Since World War II, the U.S. military has focused its efforts on being able to win major combat operations in conventional engagements with its adversaries. In spite of a historical record that suggests post-conflict stability operations are an inevitable, and ultimately decisive, part of war, the U.S. has placed more emphasis on winning the fighting, and less on what comes next – a mopping-up phase prior to returning the troops home.² This has resulted in increased risk to the mission and the force because it is in this post-combat phase in which war is won.

Post-World War II experience suggests that the U.S. needs to approach transition to post-combat operations more deliberately in future conflicts.³ Beyond the inherent, yet often-overlooked, need to prepare for post-combat in the first place, comes an equally compelling

¹ Carl von Clausewitz, *On War*, ed and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 108.

² Frederick W. Kagan, "War and Aftermath," *Policy Review*, Number 120, August and September 2003, available from <http://www.policyreview.org/aug03/>.

³ For additional background on U.S. experiences in WW II and Korea see Russell F. Weigley, *The American Way of War*, (Bloomington, IN: Indiana University Press, 1973); Vietnam see, Michael Lind, *Vietnam: The Unnecessary War*, (New York, Simon and Schuster, 1999); Haiti see Kevin C.M. Benson and Christopher B. Thrash, "Declaring Victory: Planning Exit Strategies for Peace Operations," *Parameters*, Autumn 1996, pp. 69-80; Panama, see Thomas Donnelly, Margaret Roth, and Caleb Baker, *Operation Just Cause*, (New York: Lexington Books, 1991); Balkans see Samantha Power, *A Problem from Hell: America and the Age of Genocide* (New York: Harper Collins, 2002); Iraq and Afghanistan, see *U.S. Central Command, Command Posture Statement* by General John P. Abizaid to the House Armed Services Committee, 3 March 2004.

reason. Since the 1990s, the world has witnessed the U.S.'s unprecedented ability to apply military force. Operations DESERT STORM, ALLIED FORCE, ENDURING FREEDOM (OEF), and IRAQI FREEDOM (OIF) all underscored to potential competitors the risks involved in confronting U.S. military power directly.⁴ Adversaries now are more likely to challenge the U.S. unconventionally and even after the cessation of major combat operations, as demonstrated in Iraq in 2003 and 2004. Adversaries may seek to exploit seams and vulnerabilities during operations other than combat to obtain their political aims.⁵ This may result in increased risk to both troops and accomplishment of strategic objectives.

OEF and OIF reaffirmed that the U.S. military can dominate the current battlefield. Although these conflicts had significant unconventional aspects, they displayed the dominance of U.S. forces in conventional military engagements during major combat operations (MCO). In spite of its combat effectiveness however, the U.S., and its coalition partners, apparently have been less successful in achieving a similar level of dominance in post-conflict operations. This is likely due to several factors. First is the U.S.'s incomplete and inaccurate understanding of the nature of its enemy and the conflict in which it was engaged. Second is ineffective interagency planning for transition between major combat operations and post-conflict stability operations. A third factor is counterintuitive; part of the U.S. difficulty in post combat operations is due to the unprecedented efficiency, speed, and precision with which it applies combat power to defeat its enemies during major combat operations.⁶

⁴ Although these operations were fought within a coalition and it is likely that the U.S. will continue to seek coalition participation in future conflicts, this paper focuses primarily on the U.S. military.

⁵ Michael Lind, *Vietnam: The Unnecessary War*, (New York: Simon and Schuster, 1999), xviii.

⁶ Jeffrey Record, *Bounding the Global War on Terrorism* (U.S. Army War College, Strategic Studies Institute, December 2003), 39, describes U.S. administration shortcomings in assumption of a

These conflicts provided insight on the evolving doctrinal concepts that the U.S. military is adopting to operate in this new environment. The military has an increasing awareness of the complex challenges posed by the current environment and their impact on its responsibilities across the range of military operations from conflict to MOOTW.⁷ Military and civilian leaders as well as influential actors in the defense industries, academia, and think tanks cite these operations as supporting their views on how to transform the military to adapt to the evolving nature of warfare. The relationship among these myriad concepts is not yet codified in doctrine, however, effects-based operations (EBO) appears to be the central organizing theme around which others are organized. EBO is already influencing the U.S. military way of war and military operations other than war (MOOTW).⁸

EBO enable the efficient and effective application of combat power, often at an unprecedented speed. The increased tempo with which forces are able to operate makes timely and accurate assessment of operational progress increasingly demanding. This challenge potentially is most significant during the transition from rapid decisive combat operations to long-term post-combat operations.⁹ Recent literature advancing EBO as part of DoD Transformation makes a logical case for its merits, however, without measurable criteria that realistically account

liberation scenario in which it would inherit a post-Saddam Iraq with functioning government ministries and police and other security forces; it anticipated neither the government's abrupt disintegration nor the emergence of irregular warfare against U.S. forces.

⁷ A description of the implications of the emerging security environment is provided by Michael Evans, "From Kadesh to Kandahar: Military Theory and the Future of War", in *U.S. Naval War College Review*, Summer 2003. <http://nwc.navy.mil/press/Review/2003/Summer/art6-su3.htm>.

⁸ U.S. Department of Defense. *Quadrennial Defense Review Report (QDR) 2001*, (Washington, DC: 30 September 2001, iv, on-line, Internet, 5 November 2001, available from <http://www.comw.org/qdr/qdr2001.pdf>; U.S. Department of Defense. *2003 Transformation Planning Guidance (TPG)*, December, 2003; and *Joint Vision 2020* (Washington, D.C.: Joint Chiefs of Staff, 2000).

⁹ These concepts are central to the Joint Operational Concepts of major combat operations (MCO) and post combat operations (PCO) described by the TPG.

for its impact across the physical, informational, and cognitive domains of warfare, EBO's potential may not be realized as forces transition from combat to post combat operations, and may even increase risk. Decision-makers may be seduced by the efficiency of EBO without a true appreciation for the associated risk to their mission and their troops.¹⁰

Organization, Methodology, and Criteria

Since the end of the Cold War, the U.S. military increasingly has been involved in operations of a dynamic, unpredictable nature. To organize its forces to operate in this dynamic environment, it often creates a temporary organization – the Joint Task Force (JTF) – comprised of service forces under a joint commander to accomplish missions assigned by the President and Secretary of Defense. Upon completion of the mission, these forces return to control of their habitual headquarters. While the mission, composition, and command relationships of each JTF differs, they share some common characteristics and challenges. These organizations simultaneously organize, deploy, and employ military forces from more than one service in support of strategic objectives. Additionally, the rapidly-formed, temporary JTF headquarters faces the more-formidable task of planning and executing military operations in support of a transition to a long-term political, diplomatic, and economic solution in pursuit of national policy.¹¹

¹⁰ Kagan.

¹¹ U.S. Department of Defense, *Joint Pub 5-00.2, Joint Task Force (JTF) Planning Guidance and Procedures*, (Washington, DC: Government Printing Office, 13 Jan 1999), I-1. A JTF is a joint force constituted and designated by a JTF establishing authority (Secretary of Defense, Combatant Commander, subordinate unified command, or existing JTF). JTFs are established on a geographical area or functional basis when the mission has a specific limited objective and does not require overall centralized control of logistics. Operations may be conducted unilaterally or in cooperation with friendly nations. Normally, a JTF is dissolved when the purpose for which it was created has been achieved.

U.S. military experiences in OEF and OIF and the ongoing Global War on Terror (GWOT) suggest that the U.S. military should anticipate more involvement in operations of a joint and expeditionary nature, although not every use of force requires the formation of a JTF.¹² Because its responsibilities may involve air, land, sea, space, and special operations executed across the range of military operations, the JTF provides a useful lens with which to examine U.S. joint military capabilities and to assess emerging doctrinal concepts focused on the integration of joint effects. This study addresses the issue of a JTF mitigating risk during transition from combat to post combat operations by using EBO.

An examination of the current security environment identifies the conditions in which a JTF operates. OIF and OEF experience illuminate the challenge of transition from combat to PCO and provide a foundation for the development of a definition of operational risk. Analysis of EBO, and its subordinate concepts of operational net assessment (ONA) and network centric warfare (NCW), identifies potential adverse impacts that these concepts may have with respect to operational risk. This includes an examination of the nature of effects and limitations in their assessment. Analysis of current planning doctrine provides additional resolution on the ability of the JTF to assess and mitigate operational risk during transition to PCO. This study identifies the limitations of EBO in resolving the risk inherent in transition to post combat operations, and presents recommendations for joint operations in the future.

Joint doctrine for intelligence, planning, targeting, and post conflict operations provides the foundation for determination of the JTF's ability to assess EBO to mitigate operational risk

¹² Congressional Research Service, *Instances of Use of United States Armed Forces Abroad, 1789-1999* (Washington, DC: Library of Congress, 1999).

during transition from major combat operations to post conflict operations.¹³ Research done by the Services and U.S. Joint Forces Command (JFCOM) in the development of EBO supplements this examination. A review of concepts advanced by several theorists provides background regarding both risk and effects-based thinking. Criterion for analysis is precision of operational risk – precision in risk identification, assessment, and management. The conditions for this analysis pertain to the transition from major combat operations to post-conflict operations. This study develops a definition of operational risk and provides guidelines for the development of an operational risk management process.

The U.S. military focus on the application of overwhelming combat power during MCO has been demonstrated to friends and foes alike. However, this success has diverted attention from the requirement to ensure effective transition to post combat operations – the decisive part of war. In addition to this misdirected focus, the accelerated tempo at which the U.S. military conducts major combat operations has decreased the time available for the JTF to prepare for execution of post combat operations. This has resulted in increased risk to the mission and the force. This necessitates a more detailed examination of transition operations and associated risk.

¹³ The Standing Joint Force Headquarters (SJFHQ) is another DoD initiative intended to address this challenge. The SJFHQ is a team of operational planners and information command-and-control (C2) specialists that form the backbone of a JTF command structure for each geographic combatant commander. The SJFHQ provides a situationally-aware in-place C2 capability, reducing the ad hoc nature of JTFs. SJFHQ conduct effects-based, adaptive planning in response to contingencies, with the objective of defeating enemy threats using networked, modular forces capable of distributed, seamlessly joint and combined operations. *TPG*, 9-10.

TRANSITION TO POST COMBAT OPERATIONS AND OPERATIONAL RISK

It is my experience that bold decisions give the best promise of success. But one must differentiate between strategical or tactical boldness and a military gamble. A bold operation is one in which success is not a certainty but which in case of failure leaves one with sufficient forces in hand to cope with whatever situation may arise. A gamble on the other hand, is an operation which can lead either to victory or to the complete destruction of one's force.

Field Marshal Erwin Rommel, *The Rommel Papers*¹⁴

The 2001 *Quadrennial Defense Review* (QDR) describes DoD's transformation to prepare for the challenges of the 21st Century. The DoD 2003 *Transformation Planning Guidance* (TPG) emphasizes the need for changing both the ways and the means with which the military contributes to the nation's security. The TPG stresses the imperative to "transform not only the capabilities at our disposal, but also the way we think, the way we train, the way we exercise and the way we fight," and develop fundamentally joint, network-centric, distributed forces capable of rapid decision superiority and massed effects across the battlespace. The QDR and TPG emphasize pursuit of an ability to conduct major combat operations at an unprecedented tempo and precision. What they fail to address adequately is that these desired improvements have the potential to increase risk to the force and undermine prosecution of the decisive phase of war – post-conflict operations – in which the nation, and its coalition partners, secure the political objectives for which conflict is waged.¹⁵

¹⁴ *The Rommel Papers*, Ed. B.H. Liddell Hart (New York: De Capo Press, 1953), 201.

¹⁵ TPG and QDR.

Neither Joint nor Army planning doctrine emphasizes the requirements for termination and transition operations.¹⁶ The U.S. Army mission essential task list (METL) describes the critical tasks performed by the Army for the joint force. These tasks are shape the security environment, respond promptly to crisis, mobilize the Army, conduct forcible entry operations, dominate land operations, and provide support to civil authorities. Absent from the METL is any direct emphasis on PCO -- the phase in which the winning of the war, and peace, is secured.¹⁷ This may be due in part to a lack of clarity in the division between combat and PCO, both in the view of the U.S. and its potential adversaries.¹⁸ When the military transitions from combat operations to post-hostilities, it enters an environment in which it focuses on military operations other than war (MOOTW). MOOTW encompass the use of military capabilities short of war and may complement any combination of the diplomatic, economic, and informational instruments of national power and occur *before, during, and after* war.¹⁹ A variety of complex and ambiguous threats may persist in this environment.²⁰ There is some recognition and corresponding action within DoD that this mission set requires additional emphasis.²¹

¹⁶ Since the Army is the service with the predominance of responsibility for post-conflict and stability operations, discussion of PCO relies heavily upon joint and Army doctrine.

¹⁷ U.S. Department of the Army, Field Manual 1, *The Army* (Washington, DC: U.S. Government Printing Office, 14 June 2001), 22.

¹⁸ An unclear definition of war -- or inconsistent definitions between the U.S. and its adversaries -- may be a cause of this problem.

¹⁹ U.S. Department of Defense, JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*, (Washington, DC: U.S. Government Printing Office, 12 April 2001), 334, available online at <http://www.dtic.mil/doctrine/jel/doddict/>, (accessed 24 Jan 04).

²⁰ An example could be insurgents who play to international media by attacking high visibility targets to generate the perception of a much wider threat. U.S. Army War College Joint Force Land Component Commander (JFLCC) Course, Student Exercise #6, February, 2004, p.25.

²¹ JFCOM has made it the core of a major warfighting experiment. UNIFIED QUEST 04 examines scenarios involving MCO and transition to post-conflict in 2015. *Army, USJFCOM gear up for Unified Quest 2004*, USJFCOM Public Affairs (Suffolk, VA: Jan. 22, 2004), accessed 1 Feb 04 at <http://www.jfcom.mil/newslink/storyarchive/2004/pa012204.htm>).

A November, 2003 National Defense University (NDU) study suggests that the Pentagon's new war-fighting model fails to adequately take into account the manpower-intensive work of cleaning up in the aftermath of regime-changing wars. "Successes in Afghanistan and Iraq demonstrate that the new war-fighting model is very successful in the first, high-intensity phase of conflict, but there are unintended consequences," reports the director of the NDU Center for Technology and National Security Policy. "In both instances, we deployed relatively small forces very rapidly, and they won quickly and in very dominant fashion with minimal collateral damage. The result is, you end up in theater with far fewer troops than in traditional wars, [and with] an enemy that is defeated but not exhausted. And suddenly you are in a postwar period without adequate forces or planning for the next phase of nation building."²²

The NDU study envisions a multi-dimensional challenge for the joint force operating in a complex environment. This was the experience of Coalition Forces Land Component Command (CFLCC) during OIF. The U.S. Central Command (CENTCOM) campaign plan and CFLCC operational plan had less distinct delineation between operational phases than previous large-scale combat operations. As opposed to the discrete phase building combat power during OPERATION DESERT SHIELD in preparation for major combat operations in OPERATION DESERT STORM, CFLCC and the joint force commenced major combat operations from a "rolling start" as required combat power still flowed into the theater of operations. Additionally, the imperatives of conducting a rapid ground offensive over extended

²² *Transforming for Stabilization and Reconstruction Operations*, Ed. Hans Binnendijk and Stuart Johnson, National Defense University, Center for Technology and National Security Policy, November 12, 2003, and James Kitfield, "About-Face," *National Journal*, January 31, 2004, available at <http://nationaljournal.com/>.

distances with a relatively small force necessitated a “blurred transition” between major combat operations and PCO along multiple lines of operation.²³

Planning for Transition

U.S. military doctrine emphasizes defeat of an enemy’s combat forces -- not replacement of an opposing state’s political leadership which usually is required to consolidate victory.²⁴ Due to the temporary nature of most JTFs, planning often is under time constraints and follows Crisis Action Planning (CAP) procedures.²⁵ For understandable reasons such as the nature of the crisis, time constraints, and ad hoc building of a new organization, JTF leaders and planners expend significant energy on assembling a team of disparate organizations, deploying it to an area of operations, and employing it decisively to accomplish an evolving mission in support of policy. Due to confusing nature of many crises, particularly in their early stages, political leadership may not be able to provide the joint commander with clear objective endstate criteria at the onset of operations, and sometimes not even upon their conclusion.²⁶

²³ The lines of operation were Security, Stability, Support, Humanitarian, and Political. Copy on file with author.

²⁴ Nadia Schadlow, “War and the Art of Governance,” *Parameters*, Autumn 2003, 92.

²⁵ JTFs plan using either the Deliberate or CAP process. As of March, 2004, the Joint Planning construct is under review at the direction of the SecDef. The emerging planning methodology -- Rapid Adaptive Planning -- will incorporate aspects of both Deliberate planning and CAP on a more time-compressed and iterative basis.

²⁶ General Maxwell Taylor summarized the reasons for this lack of clarity:

“For one thing, busy senior officials capable of providing it [political guidance] are usually so engrossed in day-to-day tasks that they have little leisure for serious thought about the future beyond the next federal budget. Also, it is a risky business for a senior politician to put on public record an estimate of future events which, if wide of the mark, would provide ammunition to his adversaries. Similarly, a President who announces specific policy goals affords the public a measure of his failure if he falls short of his hopes. Hence it is common practice for officials to define foreign policy goals in the broad generalities of peace, prosperity, cooperation, and good will—unimpeachable as ideals but of little use in determining the specific objective we are likely to pursue and the time, place, and intensity of our efforts.” Taylor quoted in Keith A. Dunn, “The Missing Link in Conflict Termination Thought: Strategy,” in *Conflict*

Joint planning doctrine does not emphasize planning for termination and transition operations.²⁷ Although Joint Pub 5-00.2, *JTF Planning Guidance and Procedures*, addresses them, they are subsumed in a broader context. The “Scope of Joint Operational Planning” envisioned in Joint Pub 5-0, *Joint Planning*, and the draft revision of its update, includes Mobilization, Deployment, Employment, Sustainment, and Redeployment planning.²⁸ The critical, and often long-term, requirements for termination and transition planning fall within employment and redeployment planning. Since these are the stages in which successful military operations secure the larger political objectives, it would be reasonable to place more explicit emphasis on them.

Joint Pub 5-00.2, *JTF Planning Guidance and Procedures*, offers planning considerations for termination of hostilities and transition of control to another organization, however, these areas are underdeveloped. It stresses planning for termination of operations must be ongoing during all phases of COA development, deployment, and execution, and that the JTF must establish indicators of success to determine the conditions necessary to bring operations to a favorable end. It cautions that missions such as peace operations may not be achievable without restructuring or additional assets. The transition process is influenced by many factors and often requires high-level interagency approval and long-lead times. End state, time-frame for

Termination and Military Strategy: Coercion, Persuasion, and War, ed. Steven J. Cimbala and Keith A. Dunn (Boulder, Colo.: Westview Press, 1987), p. 178.

²⁷ See Kevin C.M. Benson and Christopher B. Thrash, “Declaring Victory: Planning Exit Strategies for Peace Operations, *Parameters*, Autumn 1996, pp. 69-80

²⁸ Joint Publication 5-0, *Doctrine for Planning Joint Operations* (2nd Draft) Washington, DC: December 2002, App A.

operations, guidance from higher authority, and political policy provide focus for transition planning.²⁹

While not intended to provide comprehensive answers to the challenge of termination and transition operations, JP 5-00.2 does not provide adequate focus for JTF planners. A checklist does not provide answers to complex doctrinal challenges, particularly at the operational and strategic levels, however, it should help those using it to ask the right questions. The checklists may serve as a start point for planning, however, they do little more than pose general questions regarding the achievement of the end state, operations objectives, and consideration of the underlying causes of the conflict.³⁰ While these are valid topics they lack the precision to enable the JTF to focus on the decisive aspects of conflict termination. They are not presented in an effects-based format nor do they provide a solid foundation with which to craft useful measures of effectiveness (MOE). Since JP 5-00.2 is the capstone publication for JTFs, it is necessary to examine supporting doctrinal references to determine if they provide adequate precision to mitigate risk during termination and transition.

The *Universal Joint Task List* (UJTL) provides a menu of capabilities that can serve as the JTF commander's tools to accomplish his mission. UJTL tasks, conditions, and standards provide a degree of precision that may be useful in the quantification of risk.³¹ The UJTL

²⁹ JP 5-00.2, *JTF Planning*, IX-54-56.

³⁰ JP 5-00.2, *JTF Planning*, IX-54-55.

³¹ U.S. Department of Defense, Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3005.04C, *Universal Joint Task List* (UJTL), (Washington, DC: Joint Chiefs of Staff, 1 July 2002). The UJTL contains a comprehensive hierarchical listing of the tasks that can be performed by a joint force. It also contains a common language of conditions to describe the operational context in which tasks are performed and a menu of measures of performance for each task. These measures are used to develop standards of performance consistent with mission requirements. The UJTL does not address how a task is performed (found in joint doctrine), or "who performs the task" (found in the concept of operations). The

contains a common language of conditions to describe the context in which the joint force operates as well as measures of performance for each task that a joint force can perform. Planners may use these measures to develop standards of performance for the force, or a subordinate element, to perform in terms common to all components.³² Potential metrics for the operational task of “removing operationally significant hazards” are numbers or percentage of casualties, delay as a function of time, percentage of strategically significant hazards successfully removed or neutralized, percentage of the force exposed to or affected by operational hazards, and percentage of operationally significant hazards identified by the joint force.³³ Although these metrics provide some precision, they are not adequate tools to articulate operational risk.

The U.S. Army’s role of prompt and sustained land combat means it usually is the military force that occupies the terrain of the defeated enemy at the conclusion of combat operations. It becomes the de facto force of choice to inherit the bulk of post-conflict military responsibilities, and many non-military responsibilities as well. Some responsibilities, particularly related to governance, are those that the Army generally has not sought due to concerns about the dilution of resources away from combat missions. This view reflects how the military would like things to be as opposed to realistically dealing with things as they actually are. Recognition of governance operations as a component of war suggests that planners need to rethink those tasks that have traditionally formed the core of the military profession. War planners need to consider how combat operations and governance operations should inform each

UJTL helps identify “what” is to be performed in terms common to multiple combatant commands and joint force components. JP 5-00.2, IX-40.

³² JP 5-00.2, *JTF Planning*, IX-40

³³ *Universal Joint Task List*, B-C-C-137.

other, since they are part of the same campaign.³⁴ This tension now is exacerbated by the speed of major combat operations. Military operations are faster, the ground force is smaller, and there is less time for other organizations to prepare for assumption of the governance role.

Further complicating the planning challenge is a general lack of understanding of cultural factors on the long-term success of U.S. military operations. Relevant cultural considerations are not only those of the adversary's population, but of other regional and coalition actors as well. This is an area in which the U.S. military has expended much effort since the end of the Cold War, but has far yet to go. Doctrine offers some general planning guidance pertaining to cultural considerations, but mostly in a conventional context.³⁵

Operational Risk

As demonstrated in OIF, the ability of the U.S. military to initiate and rapidly conclude major combat operations increases risk to the force after transition to post combat operations. The unprecedented tempo of deployment and employment of force imposes a requirement for accelerated planning for transition to long-term PCO. Planners have less time to prepare for transition operations because of the limited duration of major combat operations. The U.S. way of war enabled by EBO can overwhelm the enemy during MCO, yet degrade the effectiveness of PCO by reducing the time available for planners to prepare for it. This may induce an increase in risk beyond that caused by the uncertainty, ambiguity, and friction inherent in warfare.³⁶

³⁴ Schadlow, 90-93.

³⁵ U.S. Army Command and General Staff College, *Predictive Cultural Analysis* (Fort Leavenworth, KS: School of Advanced Military Studies, February, 17, 2004), and JP 5-00.2, VI-9.

³⁶ U.S. Department of the Army, Field Manual 100-14, *Risk Management* (Washington, DC: U.S. Government Printing Office, 23 April 1998), 1-2.

There is sparse useful guidance in joint doctrine regarding the concept of operational risk. The most detailed discussion of risk pertains to matters of force protection and tactical safety.³⁷ Doctrine defines risk as the “probability and severity of loss linked to hazards,” where a hazard is a “condition with the potential to cause injury, illness, or death of personnel; damage to or loss of equipment or property; or mission degradation.”³⁸ Reference to operational risk is broad, conventionally-focused, and offers only general considerations for assessing and managing it.

Joint doctrine states that risk is inherent in military operations and operations may involve a variety of risks. Risks may include the implications of mission failure to national prestige or joint force morale and risk to the safety of joint force troops. Commanders consider many factors as they identify risk in combat or potential combat situations. To address risk, they may apply additional combat power by reallocating forces or by shifting supporting operations or they may decide the risk is acceptable.³⁹ This guidance is not adequate for the JTF planning a transition from combat to post combat operations. Other publications intended to supplement doctrine at the JTF-level – the *Universal Joint Task List* and the *JTF Master Training Guide* – only vaguely allude to a concept of operational risk.⁴⁰

³⁷ *Multiservice Tactics, Techniques, and Procedures for Risk Management*, FM 3-100.12, U.S. Army Training and Doctrine Command Fort Monroe, Virginia; MCRP 5-12.1C, Marine Corps Combat Development Command, Quantico, Virginia; NTTP 5-03.5, Navy Warfare Development Command, Newport, Rhode Island; AFTTP(I) 3-2.34, Headquarters Air Force Doctrine Center, Maxwell Air Force Base, Alabama, 15 February 2001, and FM 100-14, *Risk Management*.

³⁸ U.S. Department of Defense. JP 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: U.S. Government Printing Office, 12 April 2001). Available online at <http://www.dtic.mil/doctrine/jel/doddict/> (accessed 24 Jan 04), 231, 459.

³⁹ *Joint Doctrine Encyclopedia*, accessed 12 Jan 04 (http://www.dtic.mil/doctrine/jrm/encyr_w.pdf), 624.

⁴⁰ UJTL, B-C-C-54-57. UJTL parses combat assessment into its discrete elements, but makes no reference to risk. The Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3005.05, *Joint Task Force Master Training Guide (JTF MTG)* (Washington, DC: U.S. Government Printing Office, 15 April 1997), 5-II-9, presents only elementary metrics for risk assessment within Operational Mission Analysis, citing the

The joint force uses a process of risk management to *identify, assess, and control* risks arising from operational factors and make decisions that balance risk cost with mission benefits.⁴¹ Since EBO are at the forefront of emerging doctrine, it is necessary to determine how they affect the JTF's ability to identify, assess, and manage operational risk. OIF experience suggests that the efficiency of EBO, at least in the delivery of lethal effects during MCO, may have complicated the attainment of overarching political and strategic objectives after the conclusion of major combat operations.

Summary

Neither Joint nor Army planning doctrine emphasizes the requirements for termination and transition operations. This lack of emphasis on the decisive phase of war is exacerbated by the ability of the U.S. military to initiate and rapidly conclude major combat operations. In spite of their efficiency and accelerated tempo, emerging operational warfighting concepts may cause unintended higher-order effects that increase risk to the mission and the force after transition to post combat operations. It is not yet clear how the JTF may use these same new warfighting concepts to mitigate risk in transition from combat to post combat operations. Effects-based thinking may provide a partial solution with its focus on a more comprehensive understanding of higher-order effects.

percentage of identified risks having a written risk assessment and percentage of identified risks determined to be acceptable by the commander.

⁴¹ JP 1-02, 459 (accessed 24 Jan 04).

EFFECTS-BASED THINKING

The focus at a given level of war is not on the specific weapons used, or on the targets attacked, but rather on the desired effects.
AFDD 2, Organization and Employment of Aerospace Power⁴²

OEF and OIF underscored the battlefield dominance of the U.S. military. Although these conflicts had significant unconventional aspects, they also displayed the capability of U.S. forces in conventional combat engagements. In spite of the effectiveness of its forces during major combat operations, however, the U.S. and its coalition partners have been less successful achieving a similar level of decisiveness in post-combat operations. Some of this is due to the U.S.'s inaccurate understanding of the nature of its enemy and of the conflict in which it is engaged; it is likely also attributable to ineffective interagency planning for transition to post-conflict operations.

In addition to confirming that the U.S. is challenged by adaptive enemies willing to wage wars of a different nature than those for which it has prepared, OEF and OIF also exposed trends in how future conflicts may be waged and provide insight toward the application of evolving doctrinal concepts that the U.S. military is pursuing.⁴³ Military and civilian leaders as well as

⁴² U.S. Air Force, Air Force Doctrine Document (AFDD) 2, *Organization and Employment of Aerospace Power*, (Washington, DC: 17 February 2000), 2.

⁴³ Cook, Nick. "Effects-Based Air Operations: Cause and Effect," *Jane's Defence Weekly* 39:52+ June 18, 2003, and Gerry J. Gilmore, *Jointness, Transformation Benefit from Lessons Learned in Battle*, (Washington, D.C: American Forces Press Service, Jan 21, 2004), (accessed 1 Feb 04 at: <http://www.jfcom.mil/newslink/storyarchive/2004/pa012104a.htm>). Lessons learned from U.S. military operations in Afghanistan and Iraq are greatly assisting Defense transformation efforts, according to Commander of U.S. JFCOM, Navy Admiral Edmund P. Giambastiani Jr. "The fact that we are conducting (those) operations with the breadth and depth that we are allows our services and allows our joint forces to

influential actors in the defense industries, academia, and think tanks cite details of these operations as providing support for their views on how to transform the military to adapt to the evolving nature of warfare.⁴⁴ Much of the OIF analysis emphasizes the key role played by EBO in the development of a concept of operations that sought to separate the Iraqi regime from its population through a combination of psychological operations and selective targeting, even as conventional military engagements were underway.⁴⁵

Concurrent with Transformation initiatives, JFCOM has begun to establish the doctrinal lexicon of a transformed DoD.⁴⁶ New terms of reference include EBO, effects-based planning, effects-based targeting, network-centric warfare, and operational net assessment. As DoD codifies these concepts and terms into doctrine, there will be an impact on the conduct of warfighting. Key terms such as *effects, planning, conditions, objectives, missions, targets, decisive points*, and *center of gravity* may require redefinition. This is more than an academic issue -- these terms are fundamental to planning and measuring the success of that planning during the conduct of operations. Ambiguity among doctrinal terms may challenge the JTF to assess operational risk effectively during transition to PCO.⁴⁷

experiment in a way that you can't replicate running any type of concept development and experimentation program – war games or the like."

⁴⁴ Geoff Finn, "Army Stresses 'Joint Expeditionary Mindset,'" *National Defense*, February 2004, available at <http://www.nationaldefensemagazine.org/article.cfm?Id=1324>.

⁴⁵ See Crowder, Gary L. "Effects-Based Operations," in *Military Technology*, June 2003, 21-22, and Michael Knights, "USA Learns Lessons in Time-Critical Targeting," *Jane's Intelligence Review*, July 2003, 32-34.

⁴⁶ JFCOM is responsible for leading DoD's transformation process to shape the changing nature of military operations through new combinations of concepts, capabilities, people and organizations. *TPG*, 1-5.

⁴⁷ At the operational level, applications for EBO are evident in the planning and targeting functions, however, there appears to be potential to better integrate EBO into conflict termination and transition to post conflict operations. Joint doctrinal references that address these functions are JP 3-0, *Doctrine for Joint Operations*; JP 3-09, *Doctrine for Joint Fire Support*, JP 3-13, *Joint Doctrine for*

A series of related, and sometimes overlapping, concepts describe effects-based thinking. EBO have been characterized as a *process, a methodology, a way of thinking, planning, targeting, operations*, and not operations at all, but *actions*. JFCOM defines EBO as “a *process* for obtaining a desired strategic outcome or "effect" on the enemy, through the synergistic, multiplicative, and cumulative application of the full range of military and nonmilitary capabilities at the tactical, operational, and strategic levels.”⁴⁸ An effects-based operations concept coordinates actions throughout the security environment to shape the behavior, will, or capability of adversaries, allies, and neutrals, in order to achieve well-defined strategic objectives. EBO exploits a wide range of vulnerabilities and weaknesses, rather than simply pitting strength against strength.⁴⁹

Although EBO is new, much of the thought imbedded in it is not. Military and political leaders have practiced effects-based thinking to a certain extent throughout history. A comprehensive study of EBO stresses “EBO needs to be understood in the context of what it really is and is not. EBO is not a new form of war fighting nor does it displace any of the currently recognized forms of warfare. Attrition, annihilation, coercion, maneuver, and all other such warfare concepts are unaffected by EBO.” The militaries of many nations have pursued military objectives to create the desired conditions without deeper consideration of unintended

Information Operations, JP 3-31, *Joint Doctrine for Joint Force Land Component Commander*; JP 3-60, *Joint Doctrine for Targeting*; and Joint Pub 5-00.2, *Joint Task Force (JTF) Planning Guidance And Procedures*.

⁴⁸ U.S. JFCOM Glossary (www.JFCOM.mil, accessed 31 Dec 03), emphasis added.

⁴⁹ <http://www.jfcom.mil/about/experiments/mne3.htm> (accessed 2 Feb 04)

effects created along the way.⁵⁰ One of the U.S. military's leading proponents of EBO stresses that EBO is "not a process, tool, or thing" – it is a way of thinking about things; it starts at the top.⁵¹

EBO are actions taken against enemy systems designed to achieve specific effects that contribute directly to desired military and political outcomes. They are developed in a framework that considers the full range of direct, indirect, and cascading effects that may be achieved by application of military, diplomatic, psychological, and economic instruments of power. EBO refines the current objectives-based planning process and takes it a step further through examination of conditions and causal linkages through which actions lead to objectives. The most critical element of the methodology, causal linkages, explain why planners believe the proposed actions will create the desired effects.⁵² While the logic of thinking and planning in terms of desired outcomes, or effects, has merit, it can be challenging to implement with an adequate assurance of success.

Effects-based planning is an operational planning process to conduct EBO. It aligns with the current objectives-based joint planning process, however, there are differences in focus and emphasis. Its focus on the linkage of actions to effects to objectives is intended to change how planners view the enemy, friendly forces, and what is included and emphasized in the planning process. A difference between objectives-based planning and effects-based planning is the

⁵⁰ Edward C. Mann III, Gary Endersby, Thomas R. Searle, *Thinking Effects: Effects-Based Methodology For Joint Operations*, CADRE Paper No. 15 Air University Press, Maxwell Air Force Base, Alabama ([Http://Aupress.Maxwell.Af.Mil](http://Aupress.Maxwell.Af.Mil)), October 2002, 1-2.

⁵¹ Comments made by Mag Gen David Deptula, U.S. Pacific Command Air Force, to Advanced Operational Art Studies Fellowship program, Feb 17, 2004.

“relative focus on desired versus undesired outcomes.” Effects-based planning is more expansive and considers other outcomes beyond the intended objectives that may occur as a result of planned actions.⁵³

Regardless of the efficiency of EBO at the tactical or operational levels, there is no assurance that it links to operational and strategic levels unless there is a coherent effort to develop those linkages. The planning of an effects-based campaign demands an effort to think through the potential effects of policy decisions and strategy, as well as the contribution that tactical actions might make to the achievement of operational or strategic effects. Effects-based planning facilitates translation of strategic objectives into effects and determines actions appropriate to realize those effects. In those instances in which strategic objectives are either absent or lack precision, the effects-based planning process retains utility by considering a wide variety of capabilities that may be used to generate a given effect and providing the national leadership with all feasible options.⁵⁴

Similarly, the focus of the effects-based targeting process is to produce courses of action that change the enemy's behaviors and compel him to comply with U.S. will. The behavioral changes sought are the result of effects that flow from the employment of lethal and nonlethal capabilities. Effects-based targeting seeks to generate the type and extent of effects necessary to create outcomes that secure the attainment of the commander's objectives.⁵⁵

⁵² Edward Allen Smith, *Effects Based Operations: Applying Network Centric Warfare to Peace, Crisis, and War* (Santa Monica, CA: RAND, 2001), xiv-xv, also available online at: <http://www.rand.org/publications/MR/MR1477/>, and Mann, et al. *Thinking Effects*, 1-2.

⁵³ Mann, et al. *Thinking Effects*, 29.

⁵⁴ Taylor, quoted in Dunn, 178.

⁵⁵ JFCOM Glossary, accessed 22 December 2003.

EBO Challenges: Imposition of Systemic and Psychological Effects

EBO challenges planners to shift from a mentality of servicing targets to one of producing effects that accomplish specified objectives. The premise of EBO is to use both lethal and nonlethal means at the tactical level to achieve intended direct and indirect effects at operational and strategic levels. This precise application of military resources generates effects that cascade throughout the system, limiting options available to the enemy and increasing those available to friendly forces. As described in *Thinking Effects: Effects-Based Methodology for Joint Operations*, effects are not an afterthought – they are the “integral linchpin that binds together the planning, execution, and assessment of all military actions and the actions of other agencies as well.”⁵⁶ Beyond achievement of intended second and third-order effects is emphasis on avoidance of unintended second and third-order effects. The challenge of this task increases as forces transition from predominant use of lethal means during MCO to primarily non-lethal indirect means during PCO. A lack of appreciation for this phenomenon can increase risk to the force and the mission during the decisive post-conflict phase of war.

More difficult than achieving measurable physical effects is planning and employing military action to impose systemic and psychological effects on the enemy. Do EBO adequately address systemic and psychological dimensions? The ability to affect morale and will, and the ability to coerce intended changes in human behavior are matters of uncertainty. Some would suggest however, that this is a solvable problem. One influential study offers too optimistic a viewpoint by saying that “this shortfall will remain true until the US military adopts an agreed

⁵⁶ Mann, et al. *Thinking Effects*, 26-27.

concept for EBO that addresses these and other critical issues.”⁵⁷ While it is necessary for the joint, interagency, and multinational national security community -- who this consists of may vary by the situation -- to establish common terms of reference in order to work efficiently in this realm, simply speaking the same language is not sufficient to enable reliable prediction of human behavior. Although EBO may add some clarity toward prediction of higher order effects on the will of the adversary, since the will and belief systems of the adversary are psychological factors, planning for higher order effects remains problematic.⁵⁸

Key to realization of EBO’s potential is for its practitioners to understand what EBO can and cannot do. With an understanding of its capabilities and limitations, planners then may determine how to measure the results of effects-based operations with confidence and can adequately articulate risk.⁵⁹ Some EBO proponents see EBO as so clean and precise that the enemy may never know what hit him – and perhaps does not even know that he has been hit.⁶⁰ In OIF, Coalition forces conducted an effects-based campaign that was so efficient as to overrun a medium-sized country with relatively little physical damage or destruction to the enemy. This same campaign also demonstrated the limitations of effects-based operations. It highlighted that even though they were effective in defeating enemy formations during major combat operations,

⁵⁷ Ibid, 2.

⁵⁸ Barksdale, Carl A. *The Network Centric Operations-Effects Based Operations Marriage: Can It Enable Prediction of "Higher Order" Effects on the Will of the Adversary?* Newport, RI, Naval War College, May, 13, 2002, 13-15. Also available online at: <http://handle.dtic.mil/100.2/ADA405867>, and Wesley C. Salmon, *Causality and Explanation* (New York: Oxford University Press, 1998), 7, provides a useful explanation of cause and effect in human behavior.

⁵⁹ Some critics of EBO assert the concept relies on perfect information, advanced technology, and precise air attack; therefore, it is an unachievable, narrowly-focused panacea that ignores the fog and friction of war. EBO does not depend on information dominance, high-end warfare, or even precision strike to make it useful and as a theory, it is applicable across the spectrum of conflict. Williams, Brett T. *Effects-based Operations: Theory, Application and the Role of Airpower*.

⁶⁰ Cook, 2.

an unintended effect of this “successful” use of EBO was inadequate Coalition preparation for post combat operations. It also showed that projections of EBO’s capacity to forecast human behavior are limited. This limitation is exacerbated by the challenge of attempting to control an enemy that never lost his will and does not feel as if he has been beaten.⁶¹

EBO also has a limiting factor with respect to friendly forces that implement it. There is an expanding gap between the tempo at which U.S. military forces can apply effects and their ability to assess the achievement of those effects.⁶² This tempo differential can desynchronize operations and increase operational risk to the mission and the force.⁶³ Most significant is the risk resulting during PCO that follows major combat operations. This is because effective EBO enable the rapid defeat of enemy military forces with fewer friendly forces on the ground. Although this may be an efficient use of military power, at the conclusion of combat operations there may be inadequate ground forces available to conduct long-term interaction with the population needed in decisive post conflict or counterinsurgency operations. Thus, *efficiency*-based operations may inadvertently undermine the prospects of *effectiveness*-based operations.

⁶¹ Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, NY: Cornell University Press, 1996), 314-331, and Gary Cheek, *Effects-Based Operations : The End of Dominant Maneuver?* (Carlisle Barracks, PA: U.S. Army War College, 2002), 9, also available online at: <http://handle.dtic.mil/100.2/ADA401019>. Pape and Cheek provide insight on the psychological and morale dimensions and EBO’s potential to defeat the enemy’s will. Kagan, 1.

⁶² A tool being used in JFCOM experiments to test emerging concepts is the effects tasking order (ETO). The ETO formalizes the output of JTF virtual collaborative planning and is the means to task and synchronize the actions and orders required to achieve the commander's intent. ETOs replace operations orders (OPORDs) and fragmentary orders (FRAGOs) issued to support current and future operations but do not replace component execution planning and execution orders. U.S. JFCOM Glossary (accessed 31 Dec 03).

⁶³ Comments made by Mag Gen David Deptula, PACAF, to AOASF, 17 Feb 04.

Theoretical Background

Some of EBO's limitations and potential misapplications are due to a focus on efficiency to the detriment of effectiveness. Examination of theoretical precursors to EBO illuminates a thought process that may contribute to this shortcoming. Some foundations of effects-based thinking reveal a targeting-centric process that may not account fully for the human dimensions that ultimately are decisive in warfare. This is most evident in its airpower-centric targeting methodology that does not focus on the decisive human element. As T.R. Fehrenbach cautions, "You may fly over a land forever; you may bomb it, atomize it, pulverize it and wipe it clean of life -- but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground, the way the Roman legions did, by putting your young men into the mud."⁶⁴ The targeting focus of airpower proponents at the forefront of EBO concentrate on efficiency and inadvertently diminish its effectiveness.

A number of military theorists provide theoretical foundations for EBO. In *The Command of the Air*, Giulio Douhet argued for a new approach to overcome the cost and indecisiveness of prolonged trench warfare of World War I. He proposed direct attacks on the enemy's population by strategic bombing. The effect of inflicting death and destruction directly on population centers would be to compel enemy forces from fighting due to the desire of their population to stop the bombing.⁶⁵ The outcome would be quicker, more decisive, and in the long view, more humane by reducing the magnitude of the killing. Although many militaries have attempted to put Douhet's theory into practice, a significant body of scholarship suggests that this

⁶⁴ T.R. Fehrenbach, *This Kind of War: A Study in Unpreparedness* (Washington, DC: Brassey's, 1963/1994), 290.

approach is flawed. Among the many convincing arguments against Douhet's theory are the *United States Strategic Bombing Survey* (USSBS) conducted upon the conclusion of World War II, and Robert Pape's *Bombing to Win*. These comprehensive analyses found that the failure of strategic bombing, such as that advocated by Douhet, was because the logic of Douhet's cost-benefit analysis is lost in practice. It is not predictably transferable to the behavior of human beings. Nevertheless, Douhet's approach has appeal and has had significant influence on subsequent military theorists and practitioners, particularly in air forces.⁶⁶

Douhet's theories evolved in some quarters to a "Critical component" theory of strategic interdiction. Pape offers insight into this view that seeks the potential of cascading effects. "The crucial assumption was that there exists some small, and therefore inexpensive to destroy, target set that produces a key item or service indispensable to the economy as a whole." Based on this assumption, "strategic bombing planners could bring an entire economy to a halt by researching its industrial structure to determine which supplies were used in a wide variety of industries and which of the sources of supply could be destroyed with the least effort."⁶⁷

In "The Enemy as a System," John Warden provides an example of effects-based operations in his deductive, top-down, approach to targeting. He proposes a five-ring model of enemy target sets that begins with leadership at the center and proceeds outward in concentric

⁶⁵ Giulio Douhet, *The Command of the Air* (New York, Coward-McCann, Inc., 1921/1984), 3-33.

⁶⁶ *United States Strategic Bombing Survey (USSBS), Summary Report* (Washington, DC: U.S. Government Printing Office, September 1945) and Pape, 60-62, 70.

⁶⁷ Pape, 71. EBO and NCW proponents may call upon Clausewitz for support. "One must keep the dominant characteristics of both belligerents in mind. Out of these characteristics a certain center of gravity develops, the hub of all power and movement, on which everything depends. This is the point at which our energies should be directed." Clausewitz, 595-6. Clausewitz also advises "The first principle is that the ultimate substance of enemy strength must be traced to the fewest possible sources, and ideally to one alone. The attack on these sources must be compressed into the fewest possible actions – again ideally, into one." Clausewitz, 617.

circles to organic essentials, infrastructure, population, and last, the fighting mechanism. He develops a formula of ‘Physical X Morale = Outcome,’ to guide planning and targeting, and stresses planners should focus on the physical because it generally is observable and quantifiable. Morale is much harder to measure and therefore should not be the object of operations.⁶⁸

There is a growing body of literature generated by U.S. Air Force officers indicating the Air Force has embraced effects-based methodology more fully than the other services. The U.S. Air Force has been implementing effects-based concepts for a long time, but doing it piecemeal. Efforts are ongoing to direct airpower against targets in ways that produce specific, predetermined, military and political effects as emphasized in AFDD 2, *Organization and Employment of Aerospace Power* -- “The focus at a given level of war is not on the specific weapons used, or on the targets attacked, but rather on the desired effects.”⁶⁹ The impact of the airpower-centric development of EBO concepts is that EBO is more of a targeting methodology that optimizes efficiency during MCO but does not adequately address the landpower-centric aspects critical to the effectiveness of long-term PCO.⁷⁰

⁶⁸ John A. Warden, III, "The Enemy as a System," *Airpower Journal*, No. 1, [Spring 1995](#), 40-55. Warden also advances concepts of parallel attack and strategic paralysis that were evident in recent operations such as OIF. See Phillip Meilinger, “Air Strategy: Targeting for Effect,” *Aerospace Power Journal*, Winter 1999, 48-61, for another view on the “will vs. capability” focus of targeting strategies. Meilinger describes John Boyd’s model of Observe, Orient, Decide, and Act (OODA). Boyd’s emphasis on the orient stage of the OODA Loop suggests that the mind is more important than means or physical capability.

⁶⁹ Mann, et al. *Thinking Effects*, 25, and T.W. Beagle, *Effects-Based Targeting: Another Empty Promise?* Maxwell AFB, AL, School of Advanced Airpower Studies, 2000. Available online at: <https://research.maxwell.af.mil/papers/ay2001/saastheses/beagle.pdf>. Beagle compares four major air operations: Pointblank, Linebacker II, Desert Storm, and Allied Force, to survey US airpower's combat experience with EBO, particularly procedures for targeting and combat assessment; AFDD 2, *Organization and Employment of Aerospace Power*, 2.

⁷⁰ NDU, *Stability and Reconstruction*, 5-10.

Network Centric Warfare (NCW)

A key enabling concept for EBO is NCW. EBO builds upon NCW to achieve direct, indirect, and cascading effects that may be achieved by application of military, diplomatic, psychological, and economic instruments.⁷¹ NCW is an information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision-makers, and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and self-synchronization. NCW focuses on generating combat power from the effective linking or networking of geographically dispersed forces. Within a force, a networking of the attributes and capabilities of the three domains -- physical, information, cognitive -- generate increased combat power.⁷²

One of the factors contributing to increased risk is that NCW proponents tend to focus more on the significant efficiencies that NCW promises than on the potential vulnerabilities in its effectiveness. The Office of the Secretary of Defense Director of Force Transformation, who was instrumental in the development of network-centric warfare, suggests that NCW merges warfighting capabilities into a *seamless* joint warfighting force that capitalize on greater collaboration and coordination in real time, the results of which are greater speed of command, greater self synchronization, and greater precision of desired effects.⁷³ This allusion to the seamless nature of the joint force and its processes suggests overemphasis on the efficiency of the process and less on its effectiveness in application.

⁷¹ Smith, xiv-xv.

⁷² DoD Glossary of Terms (Draft), January 29, 2004, <http://www.dtic.mil/jointvision/lexicon.doc>, 14-15, (accessed March 29, 2004).

⁷³ Arthur K. Cebrowski (VADM, USN-Ret), "The Small, The Fast, And The Many," *NetDefense*. January 15, 2004, 10, emphasis added.

Summary

EBO are actions taken against enemy systems to achieve specific effects that contribute directly to desired military and political outcomes. They are developed in a systems framework and consider the full range of effects -- direct, indirect, cascading, cumulative, and collateral -- that the application of military, diplomatic, psychological, and economic instruments of power may achieve. EBO also emphasize avoidance of unintended second and third-order effects. Limiting occurrence of negative second and third-order effects that may occur during post combat operations is a challenge to forces engaged in major combat operations. EBO's focus on efficiency to the potential degradation of effectiveness is evident in an airpower-centric targeting mentality that may not account fully for the human dimension that ultimately is decisive in warfare.

The lack of doctrinal emphasis on the requirements for transition to PCO, coupled with the ability of EBO-enabled military forces to conduct major combat operations, results in a situation in which some U.S. military strengths actually work to its disadvantage. In spite of their efficiency and tempo, effects-based operations may produce unintended effects that increase risk to the mission and the force after transition to post combat operations. In order for the JTF to use EBO to mitigate this risk, JTF planners require a more comprehensive understanding of higher-order effects that constitute the central focus of effects-based thinking. Additionally, since EBO supports increasingly rapid execution of military action by the JTF, it is necessary to determine if the JTF has a corresponding ability to assess progress of its actions and their impact on decisive post combat operations.

EFFECTS ASSESSMENT

Man is the fundamental instrument in battle. . . . Nothing can wisely be prescribed for an army . . . without exact knowledge of the fundamental instrument, man and his state of mind, his morale, at the instant of combat.

Ardant Du Picq⁷⁴

Essential to analysis of *effects-based* operations and related risk is an understanding of the term effects. There are varied descriptions of effects within Joint doctrine, but not a single unambiguous definition. Joint Pub 1-02, *DoD Dictionary*, is silent on this foundational vocabulary. JFCOM defines an effect as “the physical, functional, or psychological outcome, event, or consequence that results from specific military or non-military actions,” and that operational effects influence activities at the operational level of war and focus on campaigns and operational objectives.⁷⁵ The U.S. Air Force definition adds “systemic” outcomes to the physical, functional, and psychological outcomes specified by JFCOM, and says that these outcomes may occur at all levels of employment and may trigger follow-on consequences.⁷⁶ The 2003 DoD TPG describes three domains of warfare -- cognitive, informational, and physical – that suggests that there are three domains of effects.⁷⁷

⁷⁴ Ardant du Picq, *Battle Studies*, trans. John N. Greely and Robert C. Cotton, *Roots of Strategy*, Book II, (New York: Stackpole, 1987), 65.

⁷⁵ Joint Forces Command Glossary (accessed 22 Dec 03).

⁷⁶ Air Force Doctrine Document 2-1.2, *Strategic Attack*, draft, 1 January 2000.

⁷⁷ TPG, 9.

Nature of Effects

Doctrine also uses several lenses with which to view the nature of effects, parsing them by type, category, and characteristics. There are four *types* of effects -- physical, functional, systemic, and psychological. The two *categories* of effects are direct and indirect, and the *characteristics* of effects describe their cumulative, cascading, and collateral nature.⁷⁸ *Direct effects* are the immediate, first-order consequences of military action, unaltered by intervening events or mechanisms. They usually are immediate and recognizable. *Indirect effects* are the delayed or displaced second- and third-order consequences of military action. They may be accentuated by intermediate events or mechanisms to produce outcomes that may be physical or psychological in nature and often are difficult to recognize, due to subtle changes in adversary behavior that may hide their extent.

Effects, whether direct or indirect, possess three fundamental characteristics -- they are *cumulative*, *cascading*, and *collateral* in nature. They tend to compound cumulatively, such that the result of a finite number of direct effects is greater than the sum of their immediate consequences. Indirect effects may combine to produce changes greater than the sum of their individual contributions and may occur at the same or at different levels of war as the contributing lower-order effects. Indirect effects can cascade through an adversary target system and influence other target systems through nodes that are common and critical to related target systems. Cascading indirect effects usually flow from higher to lower levels of war. Effects can

⁷⁸ JP 3-60, *Targeting*, I-6-I-8, and Mann, et al. *Thinking Effects*, 95-99. *Physical effects* are the effects created by direct impact through physical alteration of the object or system targeted by the application of military action. *Functional effects* are the direct or indirect effects of an attack or operation on the ability of a target to function properly. *Psychological effects* are the results of actions that

create unintended, or collateral, consequences, usually in the form of injury or damage to persons or objects unrelated to the objectives. Projection of all effects is an inexact process and becomes increasingly difficult as effects compound and cascade through target systems.⁷⁹

Although the varied descriptions and definitions of effects specify or allude to effects on human behavior, they tend to be somewhat sterile. They do not account fully for human nature and its decisive impact on the securing of strategic goals during post combat operations and MOOTW. It is toward this lacuna that studies of cultural awareness and predictive battlespace awareness are directed. What EBO may not address adequately is that man is at the center of all factors pertaining to warfare. As Ardant du Picq intoned in the mid-Nineteenth Century, too many military planners “fail to consider as a factor in the problem, man confronted by danger. Facts are incredibly different from all theories. Perhaps in this time of military reorganization it would not be out of place to make a study of man in battle and of battle itself.”⁸⁰ Du Picq’s focus on man as the decisive element is relevant to concepts for combat and post combat operations in the 21st Century as well.

Effects on people and decision-makers are the currency of success. Although the human dimension is not absent in EBO, it seems to be just one consideration of many, not the central element that all others support. While this may be understandable when viewed from a force-on-force comparison of relative combat power in conventional battle, it becomes problematic when applied to the human behavioral dimensions of MOOTW. Examination of the doctrinal process for assessment highlights this shortcoming.

influence the behavior in the mental domain of a target audience and *systemic effects* are the indirect effects on the operation of a specific system or systems.

⁷⁹ JP 3-60, *Targeting*, I-6-I-8.

Combat Assessment

Essential to the conduct of military operations in pursuit of policy is an assessment of those actions against assigned goals or objectives. Combat assessment is the doctrinal process with which to measure the results of operations -- primarily of targeting with lethal fires. The purpose of combat assessment is to aid in the determination of the overall effectiveness of force employment during military operations. It helps the commander understand how the operation is progressing and assists in shaping future operations. A common misperception is that combat assessment is simply battle damage assessment (BDA) – counting equipment destroyed with lethal fires. Combat assessment consists of BDA, munitions effectiveness assessment, and results in reattack recommendations; it also encompasses non-lethal actions such as information operations. It does not merely document what has happened, but more importantly, helps the commander determine what to do next. It attempts to close the loop on the targeting cycle and inform the other elements of the targeting process.⁸¹

Combat assessment focuses more on the physical domain than it does on the informational and cognitive domains. It follows a linear approach toward assessing battle damage and munitions effectiveness to develop recommendations for future targeting or attack.⁸² This methodology has utility when applied to operations in which attrition of combat capability is

⁸⁰ du Picq, 135.

⁸¹ U.S. Department of Defense, JP 2-01.1, *Joint TTP for Intelligence Support to Targeting* (Washington, DC: January 9, 2003), VI-1, and JP 3-60, *Targeting*, II-8-11. BDA includes physical damage assessment, functional damage assessment, and target system assessment. Reattack recommendations can address new targets, change of munitions, and/or delivery tactics. Regarding IO, assessment is based on battle damage indicators at selected monitoring pts. U.S. Department of the Army FM 7-15, *Army Universal task List (AUTL)* (Washington, DC: January 9, 2003) provides insight on use of Battle Damage Indicators (BDI) for information operations.

the dominant criterion for success. Leaders and planners, even finding themselves in attrition-focused operations, have need for caution when using this methodology however. The USSBS and Pape among others have found ample evidence of limiting factors including deception efforts, resilience, and limitations assessing BDA.⁸³ This methodology has less utility in operations in which the degradation of the more intangible factor of the enemy's morale is the predominant criterion of success. Since most, if not all, conflicts ultimately are determined by the will of the combatants to continue fighting, ambiguity regarding the enemy's state of mind and morale make assessment of this variable a challenge to the operational planner.

Combat assessment contributes to the operational commander's confidence in what he knows and what he does not know and helps him to articulate the level of risk he is willing to accept in the shaping he provides his subordinate commanders. *Joint Tactics, Techniques, and Procedures for Intelligence Support to Targeting*, states that to determine the effectiveness of an operation, the commander needs answers to three questions. First, were the desired outcomes achieved with the target and with respect to the larger target system (BDA)? Second, did the assigned forces perform as expected (MEA)? Finally, what should be done if the desired outcomes were not achieved (Reattack Recommendations)?⁸⁴ A shortcoming of this approach is that it does not explicitly address the identification, analysis, and impact of those *unintended*

⁸² *UJTL*, OP 3.1.6, Conduct Operational Combat/MOOTW Assessment; 3.1.6.1, Assess BDA; 3.1.6.2, Assess MEA; 3.1.6.3, Assess Reattack Recommendations, and Joint Pub 3-60, Fig II-2.

⁸³ Mann, et al. *Thinking Effects*, 20-21, describes WWII & DESERT STORM BDA challenges. *U.S. Army Battle Command Training Program (BCTP) Exercise Trends* (Fort Leavenworth, KS: BCTP, 2001-2003), from 2001-2003 highlights the challenges operational headquarters continue to have conducting BDA and combat assessment.

⁸⁴ *JP 2-01.1, Intelligence Support to Targeting*, VI-1.

effects that also result from friendly actions. This gap has implications for risk identification, assessment, and management required of the JTF commander.

The combat assessment process is dependent upon timely BDA. During OIF, BDA feedback to the components from CENTCOM was not fast enough to support decision-making in high-tempo operations. In addition to the time anticipated to process and develop federated BDA, a number of factors added to the delay including severe sandstorms that degraded collection capability, an enemy that did not present his formations as expected, and the enemy's piecemeal reinforcement of units already attacked by fires which blurred the distinction between formations.⁸⁵ These conditions limited the effectiveness of combat assessment because there was too little useful BDA and it was too late. With the rapid tempo of operations, planners strove to make assessments in time to influence future targeting and provide "predictive assessment."⁸⁶ . Due to a dearth of quantifiable BDA based upon observation of destroyed equipment, planners

⁸⁵ Iraqis used deception and denial to good effect. With 12 years of practice countering Operation Southern Watch and Operation Northern Watch, they were proficient at techniques of using dummy equipment, and hiding equipment in haystacks, buildings, and tunnels, in addition to placing equipment in mosques, schools, and hospitals. Iraqi deception and denial techniques caused an expansion in the time required to collect and process BDA after a target was struck. After the target is struck, ISR needs to collect, then analysts need to analyze and confirm their analysis prior to dissemination. Email, COL Steve Rotkoff, CFLCC Deputy C2, 3 May 2003.

⁸⁶ In OIF, during conduct of the main fight against Republican Guard (RGFC) divisions, targeting focus was on specific units, e.g., destroy the Medina RGFC Division. Over time, and due to several factors, this essential fire support task evolved to destroy RGFC units south of Baghdad and east of Karbala. Several days of intense sandstorms resulted in gaps and delays in BDA reported from CENTCOM. The repositioning of elements of other RGFC divisions (Hammurabi, Nebuchanazur, and Adnan) to reinforce the Medina, progressively blurred the distinction between these formations. It became less important to destroy the Medina than to destroy RGFC forces (occupying previous Medina positions) that were between Coalition forces and Baghdad. Author notes from OIF.

often made assessments based on what was *not* seen or detected. The lesson is that MOE must relate to accomplishment of the purpose, more than of the specified task.⁸⁷

Predictive Assessment

The purpose of combat assessment is to provide assessment in time to influence future targeting decisions. In a dynamic, rapidly-changing operation like OIF, this increases the need for “predictive assessment.” Projection of anticipated effects from lethal fires is challenging. More difficult still is projecting results from non-lethal means such as information operations and civil affairs which are intended to influence adversary and neutral populations’ behaviors and decision-making processes. Without personal observation from special forces, civil affairs, or other organizations on the ground, accurate measurement of the effects on the will of the population is speculative.⁸⁸

With its focus on assessment of observable kinetic actions, combat assessment does not explicitly support the JTF’s operational task of transition from combat to post combat operations. It devolves to a targeting scorecard as opposed to enabling the operational commander the ability to project the impact of combat actions on long-term effects he is trying to achieve at the conclusion of combat operations.

⁸⁷ One essential fire support task was to destroy a division’s artillery in order to prevent fires massed at battery level or higher. While most MOE were tied to destruction of artillery command posts and delivery systems, the assessment was based on ground forces not receiving anything other than sporadic uncoordinated indirect fire. The purpose had been achieved, although clarity on the accomplishment of the specific task was unknown.

⁸⁸ Projection of anticipated effects was complicated by different systems used to quantify impact of ATO support and its associated accounting system. The confusion pertaining to projected air support was due to the dynamic and unpredictable nature of the campaign as it unfolded and to the CENTCOM TTP for air support -- KI/CAS.

Operational Net Assessment

Operational net assessment (ONA) is an emerging concept that may supplement or change combat assessment at the strategic and operational levels. It is more comprehensive than existing doctrine for combat assessment, Joint Intelligence Preparation of the Battlefield, and staff estimates. It attempts to represent the complex nature of the 21st Century security environment by portraying potential adversaries as complex adaptive systems. A 2002 JFCOM study of ONA's implications across the areas of doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) concluded that ONA requires a synthesis of intelligence, operations, and plans functions *into a process not yet formalized*. This process would be enabled by improved information technology, increased inter-agency collaboration, experimental evidence of EBO's potential, and improved virtual collaboration.⁸⁹

ONA addresses the need for synthesis of large amounts of information into actionable knowledge useful to decision-makers in conducting an effects-based strategy. The ONA concept originated in the USJFCOM Rapid Decisive Operations Analytical Wargame in March 2000. The wargame concluded that EBO cannot be accomplished without a comprehensive understanding of the adversary as a complex system of systems comprised of political, military, economic, social, and informational and infrastructure (PMESII) elements and that this understanding requires more institutionalized collaboration across U.S. and coalition partners' system of systems.⁹⁰

⁸⁹ *U.S. JFCOM Operational Net Assessment Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) Change Recommendation Package* (accessed 2 Jan 04), 27.

⁹⁰ *DOTMLPF*, 1-9.

ONA provides the foundation for a coherent knowledge base that supports the planning, execution, and assessment of effects-based operations. It provides an understanding of the battlespace from friendly, adversary, and neutral perspectives, and is built on coalition collaboration at the strategic and operational levels.⁹¹ JFCOM defines ONA as a continuously updated operational support tool that provides a JTF commander visibility of effects-to-task linkages based on a system-of-systems analysis of a potential adversary's political, military, economic, social, infrastructure, and information (PMESII) war-making capabilities. It informs decision-makers from strategic to tactical levels regarding the complementary effects and supporting missions and tasks that can be considered when applying the full range of diplomatic, information, military and economic actions to achieve specific effects on an adversary's will and capability in support of national objectives. It is an integrated, collaborative product of DoD and other government and non-government organizations. Its purpose is to identify key links and nodes within the adversary's systems and to propose methods that will influence, neutralize or destroy them and achieve a desired effect or outcome.⁹²

ONA seeks both efficiency and effectiveness in pursuit of policy goals. Deconstruction of this definition into its components (Table 1) however, yields an inconsistency that may limit resolution of elements of operational risk.

⁹¹ "Multinational Experiment III", <http://www.jfcom.mil/about/experiments/mne3.htm> (accessed 2 Feb 04).

⁹² Joint Forces Command Glossary (accessed 22 Dec 03).

Table 1. Operational Net Assessment.

Purpose	To identify key links and nodes within adversary's systems and to propose methods that will influence, neutralize or destroy them and achieve a desired effect or outcome.
What	A continuously updated operational support tool that provides a JTF commander visibility of effects-to-task linkages.
How	Based on "system-of-systems" analysis of potential adversary's <i>political, military, economic, social, infrastructure, & information (PMESII)</i> war-making capabilities.
Who	DoD and other appropriate government and non-government organizations (NGOs).
Audience	Decision-makers from strategic to tactical levels.
Outcome	Complementary effects and supporting missions and tasks that can be considered when applying full range of DIME actions to achieve specific effects on an adversary's will and capability in support of national objectives.

The intent of ONA is to conduct a holistic analysis of the adversary's system of systems to identify weaknesses the JTF commander may exploit by accessing all elements of DIME in order to achieve specific effects. A potential shortcoming is that JFCOM has constructed the concept with a circular definition. JFCOM defines the supporting concept of Political, Military, Economic, Social, Infrastructure, and Information (PMESII) as "vulnerabilities identified by the ONA," researched as systems of systems networks that can be exploited by EBO to affect an adversary's war-fighting capability and will.⁹³ Defining ONA in terms of PMESII and defining PMESII in terms of ONA may permit omission of key factors that ultimately increase risk to the JTF. This may not account fully for the "relationships, dependencies, vulnerabilities, and strengths," crucial to the human dimension of ONA as described in *Joint Operations Concepts*, a key implementing document to DoD transformation initiatives.⁹⁴

⁹³ Joint Forces Command Glossary (accessed 22 Dec 03).

⁹⁴ Joint Operations Concepts, *JROC Draft*, 7 Mar 2003, 9.

Assessment Challenges and Risk

Assessing effects in combat and post combat operations, as well as during the transition between the two, has never been possible with the precision a commander desires. History suggests it is not likely that technological solutions will create the desired degree of clarity in the future. Overcoming this assessment shortcoming requires operational commanders to leverage the potential of warfighting concepts like EBO by designing campaigns and operations that account for both the capabilities and *limitations* of the operational assessment process and to make informed decisions pertaining to risk.⁹⁵ Some ONA descriptions imply that assessment primarily is done prior to operations. While a foundation of prior analysis is preferable, it is probable that a JTF established in response to an emerging crisis will be reliant upon incomplete strategic and operational-level ONA. The ONA process must be dynamic, relevant, and predictive in nature. It is not clear how the JTF can manage the great quantity of information that the ONA process may collect and analyze, particularly when much of the expertise required to conduct ONA resides outside the control of the JTF and even the military.

Holistic assessment of the PMESII vulnerabilities of a state or non-state actor is beyond the capabilities of a JTF staff. Pape explains that the real problem is more an issue of social science than it is of military art. What is most critical is to “learn more about how governments and publics evaluate the success or failure of national policy, and how evaluation changes in crises and wartime.” This suggests that a comprehensive assessment should result in something more sophisticated than simply a lethal targeting strategy. Pape advocates better coordinated

⁹⁵ Bowman, Christopher W. *Operational Assessment: The Achilles Heel of Effects-Based Operations?* Newport, RI, Naval War College, 2002. Also available online at: <http://handle.dtic.mil/100.2/ADA405868>.

efforts between joint, interagency, and multinational actors and the creation of permanent organizations composed of individuals with expertise in a variety of military and civilian disciplines to study the various political effects that the use of force might produce.⁹⁶

Assessment of systemic and psychological effects is neither standard nor easy. These types of effects may vary greatly from one region and target audience to another; therefore, regional and cultural studies are required to predict and analyze them with a useful level of accuracy. A challenge to the full realization of EBO's potential is development of useful assessment measurements for the various effects studied, because if the problem of predicting and assessing systemic and psychological outcomes with reasonable fidelity cannot be solved, EBO loses much of its value.⁹⁷ A void exists in the analysis of cultural implications on the achievement of intended and unintended effects.⁹⁸ In *The Air Campaign, Planning for Combat*, Warden concludes after a study of WWII and Vietnam that "military objectives and campaign plans must be tied to political objectives, *as seen through the enemy's eyes, not one's own.*"⁹⁹ This suggests that EBO focus on effects on the enemy and perhaps be articulated solely in terms of the enemy and neutral populations.

Effects Assessment: Ways and Means

Ideally, strategic decision-makers would conceptualize and articulate strategy in terms that provide coherent and flexible guidance to the joint commander responsible for achievement of specific operational and strategic effects. Having determined what effects the JTF must

⁹⁶ Pape, 330.

⁹⁷ Mann, 68.

⁹⁸ *Predictive Cultural Analysis*, 20, and JP 5-00.2, VI-9.

⁹⁹ Warden, *The Air Campaign, Planning for Combat*, 132.

achieve to contribute to strategic success, planners develop standards for success that enable timely and relevant assessment of operations toward those goals.¹⁰⁰ Having established a desired political and strategic outcome, policymakers and operational leaders should collaboratively develop standards of success for subsequent military actions and effects. Clausewitz describes an idealized approach:

The political object -- the original motive for the war -- will thus determine both the military objective to be reached and the amount of effort it requires. The political object cannot, however, *in itself* provide the standard of measurement. Since we are dealing with realities, not with abstractions, it can do so only in the context of two states at war. The same political objective can elicit *differing* reactions from differing peoples, and even from the same people at different times. We can therefore take the political object as a standard only if we think of *the influence it can exert upon forces it is meant to move*. The nature of those forces therefore calls for study. Depending on whether the characteristics increase or diminish the drive towards a particular action, the outcome will vary.¹⁰¹

Policymakers, and JTF commanders who implement policy, should pose questions that connect EBO to some form of net assessment in devising the ends, ways, means, and risk of strategy.¹⁰² While such an idealized process is not likely to be the norm, it describes a logical linkage from strategic guidance to the military effects achieved by the operational commander. It is toward this understanding of relevant causal relationships that the operational planner should strive. Emerging doctrine describes “Mission Success Criteria” that define what military forces

¹⁰⁰ *TPG*, 3.

¹⁰¹ Clausewitz, 81. A potential shortfall in this description is its focus on two states at war with each other, not a state at war with non-state actors as evident in the GWOT.

¹⁰² *Transformation Concepts for National Security in the 21st Century*, edited by Williamson Murray. [Carlisle Barracks, PA] , Strategic Studies Institute, U.S. Army War College, 2002. Also available online at: <http://purl.access.gpo.gov/GPO/LPS24947>

must accomplish to establish necessary conditions to achieve the desired endstate.¹⁰³ This is a positive step toward providing doctrinal tools that contribute to better linkage between the use of military force and the policy it supports.

Essential to efficient and effective use of power is a means with which to assess the progress of ongoing operations. Measures of effectiveness (MOE) are tools used to measure results achieved in the mission and in execution of assigned tasks. They are a prerequisite to performance of combat assessment.¹⁰⁴ MOE should be observable, mission-related, measurable, numerically realistic, easily understood, and useful.¹⁰⁵ They contribute to the effective linkage between strategic, operational, and tactical operations in the conduct of war and MOOTW.¹⁰⁶ Clausewitz again provides a useful conceptual framework.

War plans cover every aspect of war, and weave them all into a single operation that must have a single, ultimate objective in which all particular aims are reconciled. No one starts a war—or rather no one in his senses ought to do so—without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it. The former is its political purpose; the latter its operational objective. This is the governing principle which will set its course, prescribe the scale of means and effort which are required, and make its influence felt throughout down to the smallest operational detail.¹⁰⁷

MOE are most useful when they focus on observable, measurable, quantifiable actions or conditions, often associated with BDA. They are less precise in the assessment of human attitudes and will. Pape summarizes their utility -- “At best, measures of combat efficiency are

¹⁰³ Joint Pub 5-0, *Planning*, 2d draft, III-6.

¹⁰⁴ JP1-02, *DoD Dictionary*, 326 (accessed 24 Jan 04).

¹⁰⁵ JP 3-60, *Targeting*, I-8; JP2-01.1, *Intel Support to Targeting*, II-2.

¹⁰⁶ JP 3-60, *Targeting*, I-8; JP2-01.1, *Intel Support to Targeting*, II-2. and Murray, available online at: <http://purl.access.gpo.gov/GPO/LPS24947>.

¹⁰⁷ Clausewitz, 579.

measures of how quickly or cheaply forces perform military missions. They do not gauge whether mission success will achieve political purposes.”¹⁰⁸

Essential to analysis of effects-based operations and related risk is an appreciation of the multiple facets of effects. An understanding of the types, categories, and characteristics of effects enables the JTF to conduct the first step in operational risk management – risk identification. An assessment of the effects, both intended and unintended, that may occur as a result of military action is necessary to conduct the second step in operational risk management – risk assessment. However, the current process of combat assessment is not adequate to support this step – it is focused primarily on kinetic actions during combat rather than the non-kinetic effects that are the object of post combat operations. Complicating matters for the JTF is that a thorough assessment of the political, military, economic, informational, and infrastructure vulnerabilities of a state or non-state actor envisioned in the concept of operational net assessment is beyond the capabilities of a JTF staff, and requires expertise not extant within DoD.

Risk is inherent in warfare and is increased when a concept of warfare such as EBO focuses on efficiency during major combat operations to the detriment of effectiveness during post combat operations. Operational risk assessment is the process to assess the probable consequences of second and third order effects. Assessment fidelity is dependent upon the precision and reliability of assessing *physical, functional, systemic, and psychological* effects – direct or indirect, and cumulative, cascading, or collateral in nature -- across the three domains of

¹⁰⁸ Pape, 57.

operations – *cognitive, informational, and physical*.¹⁰⁹ Although built upon a foundation of operational net assessment, the JTF’s assessment usually is done in a compressed time-frame and without the desired degree of objective political and strategic guidance. Identification and assessment of the risks inherent in transition from combat to post combat operations enables the JTF to conduct the most important step in the process -- Operational Risk Management.

¹⁰⁹ Physical, functional, systemic, and psychological effects are described in Joint Pub, 3-60, *Targeting*, I-5-I-8, and Joint Pub 2-01.1, *Intel Support to Targeting*. The 2003 *TPG* provides direction to the services and DoD for transformation and to guide the way the military organizes, trains, equips, and fights. It describes three domains of warfare -- *cognitive* (exist in warfighters’ minds and encompass leadership, morale, unit cohesion, experience, training, situational awareness, strategy, doctrine, tactics, techniques and procedures), *informational* (facilitates communication of data, sharing of knowledge and conveyance of commander’s intent), and *physical* (spans land, sea, air and space environments where forces execute the range of military operations), 9.

CONCLUSIONS AND RECOMMENDATIONS

The important thing is to see the opportunity and to know how to use it.
Maurice De Saxe¹¹⁰

EBO both can help and hinder the JTF's mitigation of risk during transition from combat to post combat operations. Effects-based thinking and operations have demonstrated their potential analytically, in joint warfighting experiments, and in combat. They have been practiced to a varying extent throughout the history of the use of military power in support of political objectives. The challenges that the U.S. military must overcome to realize the potential of EBO while mitigating operational risk during post combat operations are surmountable. These challenges include an operational mentality and doctrinal emphasis focused on combat operations at the expense of PCO, over-reliance on the efficiency of new warfighting concepts without recognition of limitations in their effectiveness, inadequacy of assessment processes to support the pace of operational execution enabled by EBO, and a targeting mentality that does not focus adequately on man and his behavior, and the lack of an effects-based operational risk management process.

In spite of experience that shows post-conflict stability operations are inevitable, the U.S. places more emphasis on winning the fighting and less on the decisive post-combat phase. This has resulted in increased risk to the mission and the force. The U.S. has trained and equipped its military to defeat its enemies decisively on the battlefield, and has done this so successfully that

its enemies are changing the nature of that battlefield. Aware of the U.S. military's conventional overmatch, potential adversaries are likely to challenge the U.S. unconventionally or possibly after the cessation of combat operations to secure their political aims. This increases risk to the JTF and the accomplishment of strategic objectives.

Neither Joint nor Army planning doctrine emphasizes the requirements for termination and transition operations. This is due to a mindset that persists in focusing on major combat operations to the detriment of PCO. This is understandable when viewed from the perspective that the military's role traditionally has been to fight and win the nation's wars – conventional wars. However, as its enemies change the nature of the wars they choose to fight, the U.S. must adapt its military, as well as the other instruments of national power, to the new conditions.¹¹¹ This narrow view contributes to some improperly-focused transformation efforts that concentrate more on improvement of the military's ability to prosecute combat than to conduct post combat operations.

Absent the emergence of another organization, either interagency or international, to assume the role, the U.S. military is the only organization able to conduct the bulk of post combat operations. Even when another organization is designated and prepared to assume this responsibility, the actions by the U.S. military during combat significantly influence the decisive effects that do not manifest themselves until after the fighting stops. In spite of its combat effectiveness, and perhaps because of it, the U.S. has not been successful in dominating post-

¹¹⁰ Marshal Maurice de Saxe, *My Reveries Upon the Art of War*, trans. by Thomas R. Philips, in *Roots of Strategy* (Harrisburg, PA: Stackpole Books, 1985), 296.

¹¹¹ Richard M. Swain, "Filling the Void: The Operational Art and the U.S. Army," in *The Operational Art: Development in the Theories of War*, ed B.J.C. McKercher and Michael A. Hennessy

conflict operations. The unprecedented efficiency, speed, and precision with which the U.S. applies combat power to defeat its enemies in combat causes unintended long-term effects that adversely influence post combat operations. This operational speed also increases the challenge for planning the transition to post-conflict operations.

EBO is central to most emerging operational concepts and is influencing the U.S. military way of war and MOOTW. With its airpower-centric foundations, EBO tend to model a lethal targeting methodology suitable for combat operations yet are less appropriate for accounting for the human element necessary to winning the war. Some proponents of EBO advocate it as revolutionary – significantly changing the manner in which war is waged. This view is exaggerated. The greatest potential of EBO at the operational level may be more precise mitigation of operational risk during transition from combat to post-combat operations based upon deeper understanding of causal relationships and the cumulative, cascading, and collateral nature of effects.

The increased tempo with which forces are able to operate makes assessment of operational progress increasingly difficult. This potentially is most significant during the transition from rapid combat operations to long-term post-combat operations. Without measurable criteria that realistically account for its impact across the physical, informational, and cognitive domains of warfare, the potential of EBO may not be realized and may even increase risk. Decision-makers may be seduced by the logic of how EBO should work without an accurate appreciation for the risk to their mission and their troops.

(Westport, CT: Praeger, 1996), 147-172. Swain analyzes competing factors and processes that influence the development of operational art and doctrine.

JTFs simultaneously organize, deploy, and employ forces from more than one service in support of strategic objectives. Concurrently, they have the task of planning and executing military operations in support of a transition to a long-term political, diplomatic, and economic solution in support of national policy. Current and emerging doctrine -- for intelligence, planning, targeting, and post conflict operations -- provide an inadequate foundation for the JTF to assess progress of EBO to mitigate operational risk during transition from combat to post conflict operations.

Precision of operational risk – in risk identification, assessment, and management – is exacerbated by the conditions existing during transition from major combat operations to post-conflict operations. Resolution of operational risk requires precision in the JTF’s ability to identify risk to the mission and the force during transition to post-conflict operations. Operational risk assessment should effectively assess the probable consequences of second and third order effects. Assessment fidelity is matter of assessing *physical, functional, systemic*, and *psychological* effects across the three domains of operations – *cognitive, informational*, and *physical*. Operational risk management is the process to preclude unintended second and third-order effects and achieve the intended higher-order effects during transition to PCO.

Operational Risk Management

Regardless of the depth and quality of an operational net assessment, it is not possible to eliminate risk; therefore, having identified and assessed operational risk, JTF planners need to manage it. Future JTFs likely will be established in response to crises that initially do not present clear strategic solutions to policymakers. In the dynamic, ambiguous, and time-compressed situation in which it forms, deploys, and executes operations, the JTF must plan to achieve the long-term operational effects to secure the required conditions in post combat operations. In order to succeed in this environment, the JTF needs to leverage the potential of the emerging concepts such as EBO to manage risk and accomplish its mission.

Management of operational risk involves planning and executing operations to achieve desired effects – lethal and non-lethal, during combat and post combat operations -- while precluding unintended negative effects. This is enabled and hindered by some emerging concepts for warfighting and post combat operations. EBO facilitates execution of multiple simultaneous actions focused toward attainment of specific strategic effects at a tempo that overmatches the adversary, yet may cause unintended effects that increase risk to the JTF. Accelerated operational tempo may result in the termination of major combat operations without adequate preparation for the transition to post combat operations. This highlights the need for a methodology that accounts for the positive and negative consequences of military actions, both on the adversary and on friendly means for achieving the desired effects.

When planning to integrate lethal capabilities in pursuit of operational objectives during combat operations, JTF planners use a risk management process to balance speed and momentum with risk to the force. Due to the destructive power and range of modern weapons coupled with the intensity and tempo of modern combat, one of the planners' primary considerations is to avoid fratricide. In order to do so, they identify and assess situations that increase the risk of fratricide and then develop methods to control unnecessary risks. Preventive measures include focus areas such as command emphasis, disciplined operations, lateral coordination among components, rehearsals, standardized operating procedures, and enhanced situational awareness.¹¹² This anti-fratricide methodology offers utility in the planning of effects-based operations that build upon success during combat through the transition to post combat. In planning EBO, JTF planners must coordinate and maximize first and higher-order effects across all domains.

¹¹² JP 3-09, *Doctrine for Joint Fire Support*, I-6.

The essence of risk management is proactive recognition of potential risk and development of a concept of operations that enables employment of multiple ways and means to achieve the desired effects. The separate methods employed should not degrade the contributions of complementary ways and means or create an unintended condition harmful to the force or the mission. EBO's focus on causal relationships between actions and their effects supports proactive identification and mitigation of unintended negative consequences. Its focus on identifying and then taking steps to preclude adverse effects is consistent with existing control measures like boundaries and fire support control measures used in conventional combat operations.

The combat assessment process is not adequate to manage risk particularly in the transition from combat to post combat operations. It focuses more on measurements of lethal targeting efficiency than it does on overall mission accomplishment. Additionally, it does not deliberately assess the effects of lethal and non-lethal actions on each other or on the other instruments of national power – diplomatic, informational and economic -- and therefore does not provide a complete assessment of operational risk. Combat assessment is useful in the refinement of a targeting strategy, but needs to be broader in scope to support execution of EBO.

ONA attempts to provide the JTF the information and analysis it requires to prosecute EBO. It is not yet clear how the JTF manages the ONA process to coordinate and employ military force in conjunction with diplomatic, informational, and economic elements of power, to exploit the political, military, economic, social, informational, and infrastructure vulnerabilities of a state or non-state actor. Inherent in this challenge is development of an operations concept that accomplishes the mission at minimum necessary risk to the JTF and achieves the desired long-term effects only attainable in post combat operations.

The ONA process must be dynamic, relevant, and predictive. As demanding as assessment at the operational level may be, it is necessary for it to enable prediction, with a certain degree of confidence, the projected effects of contemplated actions. This perhaps is most

significant in the achievement of higher-order effects during transition to post combat operations. Concepts such as predictive battlespace awareness are being developed by the joint community in recognition of this need. Essential to achievement of a predictive assessment capability is a better cultural understanding of the audiences that may be influenced by U.S. military actions. Without an adequate appreciation for the affected populations and their cultures, operational risk is increased unnecessarily.

Regardless of the positive potential of EBO, the conditions of the current security environment, the American way of war, and the uncertainty, ambiguity, and friction inherent in combat ensure that the operational commander cannot eliminate risk during planning or execution of military operations in support of policy. Additionally, over-reliance and overconfidence based on significant efficiencies embodied in EBO may obscure metrics for effects assessment and inhibit the attainment of required effects. Counter-intuitively, and most significantly, the U.S. military's unprecedented ability to apply combat power during major combat operations may undermine its ability to terminate combat and secure conditions conducive to winning the war. It is, in a sense, becoming a "victim of its own success." The JTF can deliver effects on an enemy far faster than it is able to assess the impact of its effects. The impact of an airpower-centric development of EBO concepts may be that EBO becomes more of a targeting methodology that optimizes efficiency during major combat operations but does not adequately address the landpower-centric and human factors of successful long-term post-combat operations.

Recommendations: A Way Ahead

There are several initiatives the U.S. military should take to enhance the JTF's ability to mitigate risk during transition from combat to post combat operations using EBO. Some of these proposals require actions internal to the JTF; others require support from DoD and the interagency; others still from academic, private-sector, non-governmental, and multinational

organizations. These measures neither eliminate risk nor assure success, but all contribute to risk mitigation during transition to post combat operations. Since issues of policy and strategy seldom present easy answers, initiatives should aim to establish habits of thought and processes that enable policymakers and military leaders to ask the right questions. To realize the potential of EBO in the mitigation of operational risk during post combat operations, the U.S. military should reexamine its own cultural bias toward fighting the large conventional battles for which it has trained, increase doctrinal emphasis on post combat operations, improve and enrich its cultural awareness to keep man at the center of all planning, and develop an effects-based operational risk management process.

Recognition of post-combat operations as the decisive component of war suggests that military planners need to rethink those tasks that traditionally have formed the core of their profession. This requires an understanding that defeat of an enemy's combat forces in major combat operations does not ensure political victory. Since the way in which the military defeats the enemy's combat forces may have unforeseen negative consequences in post-conflict operations, U.S. military planners need to consider how combat operations and governance operations should explicitly inform each other, since they are part of the same campaign.¹¹³ The U.S. should approach transition to post-combat operations more deliberately in future conflicts because potential adversaries are aware of the U.S. military's unprecedented capabilities.

The U.S. military should refine its doctrinal emphasis to make post combat operations complementary, not subordinate, to major combat operations. This refinement should not detract from the core warfighting skills of the armed forces, but better prepare them for the inevitable

¹¹³ Schadlow, 93.

challenge that confronts them at the conclusion of combat. JFCOM should focus its energies on several DOTML-PF solutions to help the JTF mitigate risk during transition from combat to PCO. It should add Termination and Transition planning to the “Scope of Operational Planning” in JP 5-0, *Planning*, and rewrite the termination and transition checklists in JP 5-00.2, *JTF Planning*, in an effects-based format to provide planners a foundation with which to craft useful MOE.

When establishing a JTF, planners should organize the headquarters to efficiently and effectively integrate the appropriate skill sets into the planning and assessment processes. This should maximize the role of information operations, public affairs, civil affairs, and special operations forces as well as interagency, non-governmental, and multinational actors in planning, targeting, and assessment due to the holistic nature of assessment and the increased importance of gauging the mindset and will of adversaries. This should result in the early designation of those responsible for collecting, analyzing, and archiving data to assist in the assessment process.¹¹⁴

Some assessment challenges are beyond the capacity of the JTF and DoD to solve in isolation. For these broader challenges, military planners must maintain a demand on the supporting systems and processes to provide relevant and timely planning considerations. At strategic level, this requires challenging the national intelligence infrastructure to provide the deeper understanding of the enemy that the ONA and EBO concepts envision. This should be enabled by expertise resident in academia, non-governmental organizations, business, and multinational partners. Integral to effective assessment is development and exploitation of a better understanding of increasingly complex adversaries, as well as of the values and mindsets of friendly and neutral audiences. Planners should carefully choose what to measure for military

efficiency and effectiveness. Potential keys to successful implementation of EBO are thorough and timely ONA and relevant effects-based MOE that are more closely linked to purpose than task.¹¹⁵

To provide adequate tools with which to assess risk, JFCOM should develop an operational risk assessment and management tool similar to those used to perform risk management at the tactical level.¹¹⁶ Prevention of “Effects-ricide” should be the goal. Planners should use effects-based thinking to understand the causal relationships between an event, action, or target, and the effects -- positive and negative, intended and unintended -- on enemy, friendly, and neutral audiences. This tool should enable planners to account for cumulative, cascading, and collateral nature of direct and indirect actions that may result in physical, functional, systemic, and psychological effects that may occur at the tactical, operational, strategic, and political levels. Although no tool can account for all potential outcomes and be of any practical use, the methodology should contribute to asking relevant questions.

As the U.S. wages the Global War on Terrorism and continues to refine its military capabilities, it must ensure that the human factor is at the center of military transformation. The nature of this war does not permit victory by traditional military methods alone. Efficient

¹¹⁴ AFDC Handbook 10-01, *Operations -- Air and Space Commander's Handbook for the JFACC* (Washington, DC: Air Force Doctrine Center, 16 January 2003), 111.

¹¹⁵ This could include development of commander's critical information requirements (CCIR) and measures of effectiveness that mitigate risk during transition from MCO to PCO.

¹¹⁶ Other options include effects-based CCIR and effects-based decisive points that are compatible with the effects tasking order (ETO) and the effects synchronization matrix (ESM). Also, see Dubik, 33-36, for discussion of leader's use of intent, with desired effects against the enemy as the cornerstone of a subordinate commander's decision-making process, rather than the current collection of task, purpose, and commander's intent.

destruction of enemy formations in major combat operations does not translate to achievement of strategic and political objectives in the post combat environment. Only by keeping an understanding of how people react to these methods provides an opportunity for success.

Too optimistic regarding the efficiency of emerging warfighting concepts such as EBO, the U.S. and its military do not yet have adequate recognition on the limitations in their effectiveness. EBO reflects a targeting mentality that does not focus enough on man and his behavior and its supporting assessment process is not adequate to support the pace of operational execution. With EBO at the center of U.S. military thought, planners must focus on understanding all dimensions of effects. This includes direct and indirect effects, the cascading, cumulative, and collateral nature of effects, and the causal linkages between actions and higher-order effects. This understanding of higher-order effects should include focus on precluding unintended second and third-order effects. Most importantly are the effects on the will of people – friendly, enemy, and neutral – the decisive terrain in warfare.

BIBLIOGRAPHY

Books

- Addington, Larry H. *The Patterns of War Since the Eighteenth Century*. Bloomington, Indiana. University Press, 1984.
- Alberts, David S., *Information Age Transformation: Getting to a 21st Century Military*.
- Cardwell, Col Thomas A. III. *Airland Combat: An Organization for Joint Warfare*. Maxwell AFB, Ala: Air University Press, 1992.
- Clausewitz, Carl von. *On War*. Ed and trans. Michael Howard and Peter Paret. Princeton, N.J.: Princeton University Press, 1976.
- Creveld, Martin van, Canby, Steven L. and Brower, Kenneth S. *Air Power and Maneuver Warfare*. Maxwell AFB, Ala: Air University Press, July 1994.
- Davis, Paul K. *Effects-Based Operations: A Grand Challenge for the Analytical Community*. Santa Monica, CA: RAND, 2001.
Also available online at: <http://www.rand.org/publications/MR/MR1477/>
- de Saxe, Maurice. *My Reveries Upon the Art of War*. Trans. by Thomas R. Philips. In *Roots of Strategy*. Harrisburg, PA: Stackpole Books, 1985.
- Donnelly, Thomas. Roth, Margaret. Baker, Caleb. *Operation Just Cause*. New York: Lexington Books, 1991.
- Douhet, Giulio. *The Command of the Air*. New York, Coward-McCann, Inc., 1984.
- Dunn, Keith A. "The Missing Link in Conflict Termination Thought: Strategy." In *Conflict Termination and Military Strategy: Coercion, Persuasion, and War*. Ed. Steven J. Cimbala and Keith A. Dunn. Boulder, Colo.: Westview Press, 1987.
- du Picq, Ardant. *Battle Studies*. Trans. John N. Greely and Robert C. Cotton. *Roots of Strategy*, Book II. (New York: Stackpole, 1987).
- Fehrenbach, T.R. *This Kind of War: A Study in Unpreparedness*. Washington, DC: Brassey's, 1963/1994.
- Gartner, Scott S. *Strategic Assessment in War*. New Haven, Conn.: Yale Univ. Press, 1997, pp. 55-58.
- Gordon, Michael R. and Trainor, Bernard E. *The Generals' War: The Inside Story of the Conflict in the Gulf*. Boston: Little, Brown, and Company, 1995.
- Lind, Michael. *Vietnam: The Unnecessary War*. New York, Simon and Schuster, 1999.
- Makers of Modern Strategy: From Machiavelli to the Nuclear Age*. Edited by Peter Paret and others. Princeton, NJ: Princeton University Press, 1986.
- Mann, Edward C., Endersby, Gary, and Searle, Thomas R. *Thinking Effects: Effects-Based Methodology for Joint Operations*. Maxwell Air Force Base, AL, Air University Press, 2002. (CADRE paper, no. 15), Also available online at: <http://handle.dtic.mil/100.2/ADA408452>.

- _____. *Dominant Effects: Effects Based Joint Operations* Maxwell AFB, Ala.: Airpower Research Institute, Oct 2002.
- Mintzberg, Henry. *The Rise and Fall of Strategic Planning*. New York: The Free Press, 1994.
- Neustadt, Ricard E. and May, Ernest R. *Thinking in Time: The Uses of History for Decision Makers*. New York. The Free Press, 1986.
- Pape, Robert S. *Bombing to Win: Air Power and Coercion in War*. Ithaca, NY: Cornell Univ. Press, 1996.
- Pearl, Judea. "The Art and Science of Cause and Effect." *Causality: Models, Reasoning, and Inference*. Cambridge, UK: Cambridge University Press, 2000. pp. 331-358.
- Power, Samantha. *A Problem from Hell: America and the Age of Genocide*. New York: Harper Collins, 2002.
- Reynolds, Paul Davidson. *A Primer in Theory Construction*. (300.1 R464p c 4).
- Rommel, Erwin. *The Rommel Papers*. Ed. B.H. Liddell Hart. New York: De Capo Press, 1953.
- Salmon, Wesley C. *Causality and Explanation*. New York: Oxford University Press, 1998.
- Smith, Edward Allen. *Effects Based Operations: Applying Network Centric Warfare to Peace, Crisis, and War*. Santa Monica, CA , RAND, 2001. Also available online at: <http://www.rand.org/publications/MR/MR1477/>
- _____. "From Effects-based Operations to Effects-based Deterrence: Military Planning and Globalization." *Globalization and Maritime Power*. Edited by Sam J. Tangredi. Washington, National Defense University Press, 2002. 309-335.
- Swain, Richard M. "Filling the Void: The Operational Art and the U.S. Army." *The Operational Art: Development in the Theories of War*. Ed B.J.C. McKercher and Michael A. Hennessy. Westport, CT: Praeger, 1996. 147-172.
- Transformation Concepts for National Security in the 21st Century*. Edited by Williamson Murray. [Carlisle Barracks, PA], Strategic Studies Institute, U.S. Army War College, 2002. Also available online at: <http://purl.access.gpo.gov/GPO/LPS24947>
- Turabian, Kate L. *A Manual for Writers of Term Papers, Theses, and Dissertations*. 6th ed. Chicago: University of Chicago Press, 1996.
- Ullman, Harlan K. and Wade, James, Jr. *Shock and Awe: Achieving Rapid Dominance*. Washington, DC: National Defense University, 1996.
- Weigley, Russell. *The American Way of War*. New York: The Macmillan Company, 1973.

DoD Publications

- U.S. Department of Defense. *Quadrennial Defense Review Report*, 30 September 2001, iv, online, Internet, 5 November 2001, available from <http://www.comw.org/qdr/qdr2001.pdf>.
- U.S. Department of Defense. *Transformation Planning Guidance*. Washington DC: Office of the Secretary of Defense. April 2003.
- U.S. Department of Defense. *Joint Vision 2020*. Washington, D.C: Joint Chiefs of Staff, 2000.
- U.S. Department of Defense. Joint Pub 1, *Joint Warfare Of The Armed Forces Of The United States*. Washington, DC: U.S. Government Printing Office, 14 Nov 2000.

- U.S. Department of Defense. JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*. Washington, DC: U.S. Government Printing Office, 12 April 2001. Available online at <http://www.dtic.mil/doctrine/jel/doddict/>.
- U.S. Department of Defense. JP 2-01.1, *Joint Tactics, Techniques, and Procedures for Intelligence Support to Targeting*. U.S. Government Printing Office, January 9, 2003.
- U.S. Department of Defense. JP 3-0, *Doctrine for Joint Operations*. Washington, DC: U.S. Government Printing Office, 10 Sep 2001.
- U.S. Department of Defense. JP 3-07, *Joint Doctrine for Military Operations Other Than War*. Washington, DC: U.S. Government Printing Office, 10 Sep 2001.
- U.S. Department of Defense. JP 3-09, *Doctrine for Joint Fire Support*. Washington, DC: U.S. Government Printing Office,
- U.S. Department of Defense. JP 3-13, *Joint Doctrine for Information Operations*. Washington, DC: U.S. Government Printing Office, October 9, 1998.
- U.S. Department of Defense. JP 3-31, *Joint Doctrine for Joint Force Land Component Commander*. Washington, DC: U.S. Government Printing Office, 2001.
- U.S. Department of Defense. JP 3-57, *Joint Doctrine for Civil-Military Operations*. Washington, DC: U.S. Government Printing Office, February 8, 2001.
- U.S. Department of Defense. JP 3-60, *Joint Doctrine for Targeting*. Washington, DC. 17 January 2002.
- U.S. Department of Defense. JP 5-0. *Doctrine for Planning Joint Operations*. Washington, DC: U.S. Government Printing Office, 13 April 1995.
- U.S. Department of Defense. JP 5-0, *Doctrine for Planning Joint Operations* (2nd Draft). Washington, DC: U.S. Government Printing Office, December 2002.
- U.S. Department of Defense. JP 5-00.2, *Joint Task Force (JTF) Planning Guidance and Procedures*. Washington, DC: U.S. Government Printing Office, 13 Jan 1999.
- U.S. Department of Defense. *Multiservice Multiservice Tactics, Techniques, and Procedures for Risk Management*, FM 3-100.12. U.S. Army Training and Doctrine Command Fort Monroe, Virginia; MCRP 5-12.1C Marine Corps Combat Development Command, Quantico, Virginia; NTTP 5-03.5 Navy Warfare Development Command, Newport, Rhode Island; AFTTP(I) 3-2.34 Headquarters Air Force Doctrine Center, Maxwell Air Force Base, Alabama. 15 February 2001.
- U.S. Department of Defense. Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3005.04C, *Universal Joint Task List (UJTL)*. Washington, DC: Joint Chiefs of Staff. 1 July 2002.
- U.S. Department of Defense. Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3005.05, *Joint Task Force Master Training Guide (JTF MTG)*. Washington, DC: Joint Chiefs of Staff. 15 April 1997.
- U.S. Joint Forces Command. *Operational Net Assessment Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) Change Recommendation Package*. Norfolk, VA: 2002. (accessed 2 Jan 04).
- U.S. Joint Forces Command J-9 Concepts Department. *Effects-Based Operations White Paper Version 1.0*. Norfolk, VA: Joint Forces Command, 18 October 2001.
- U.S. Joint Forces Command. *Common Joint Task Force Headquarters Standing Operating Procedure*, Version 1.0. 31 March 2003 (www.jwfc.mil).

- U.S. Department of the Army. FM1, *The Army*. Washington, DC: U.S. Government Printing Office, 14 June 2001.
- U.S. Department of the Army. FM 3-0, *Operations*. Washington, DC: U.S. Government Printing Office, 14 June 2001.
- U.S. Department of the Army. FM 3-31M, *Joint Force Land Component Commander's Handbook*. Fort Monroe, VA: U.S. Army TRADOC, 2001.
- U.S. Department of the Army. FM 3-60 (6-20-10). *Tactics, Techniques, and Procedures for the Targeting Process*. Washington, DC: U.S. Government Printing Office, 8 May 1996.
- U.S. Department of the Army. FM 3-90, *Tactics*. Washington, DC: U.S. Government Printing Office, 2001.
- U.S. Department of the Army. FM 3-93 (FM 100-7). *The Army in Theater Operations*, Final Draft. Washington, DC: U.S. Government Printing Office, December 31, 2003.
- U.S. Department of the Army. FM 5-0, *Planning*, Final Draft. Washington, DC: U.S. Government Printing Office, July 15, 2002.
- U.S. Department of the Army. FM 6-0, *Mission Command*. Washington, DC: U.S. Government Printing Office, October 2002.
- U.S. Department of the Army. *FM 7-15 Army Universal Task List (AUTL) (Draft)* Washington, DC: U.S. Government Printing Office, 2003.
- U.S. Department of the Army, Field Manual 100-14, *Risk Management*. Washington, DC: U.S. Government Printing Office, 23 April 1998.
- U.S. Department of the Army. *Battle Command Training Program (BCTP) Trends 2001, 2002, 2003*. Ft Leavenworth, KS: Battle Command Training Program, 2001-3.
- U.S. Department of the Army. TRADOC Pamphlet 525-3-9, *Objective Force Fires and Effects Concept of Operation*. Fort Monroe, Virginia: United States Army Training and Doctrine Command, 15 August 2003.
- U.S. Department of the Air Force. Air Force Doctrine Document 2, *Organization and Employment of Aerospace Power*. Washington, DC: U.S. Government Printing Office, 17 February 2000.
- U.S. Department of the Air Force. Air Force Doctrine Document 2-1.2, *Strategic Attack* (Draft). Washington, DC: U.S. Government Printing Office, 1 January 2000.
- U.S. Department of the Air Force. AFDC Handbook 10-01, *Operations -- Air and Space Commander's Handbook for the JFACC*. Washington, DC: Air Force Doctrine Center, 16 January 2003.

US Government Publications

- Abizaid, General John P., General, U.S. Army. Commander, U.S. Central Command. Command Posture Statement before the House Armed Services Committee, 3 March 2004.
Available at
<http://armedservices.house.gov/openingstatementsandpressreleases/108thcongress/04-03-03abizaid.pdf>. Internet. Accessed 4 March 2003.
- Congressional Research Service. *Instances of Use of United States Armed Forces Abroad, 1789-1999*. Washington, DC: Library of Congress, May, 17, 1999.

- United States General Accounting Office. *Performance and Accountability Series, January 2003 Major Management, Challenges and Program Risks Department of Defense*. Washington, DC: GAO, 2003.
- United States General Accounting Office. *2003 Quadrennial Defense Review: Future Reviews Can Benefit from Better Analysis and Changes in Timing and Scope*. [GAO-03-13](#). Washington, DC: GAO, November 4, 2002.
- United States General Accounting Office. *Military Transformation: Actions Needed to Better Manage DOD's Joint Experimentation Program*. [GAO-02-856](#). Washington, DC: GAO, August 29, 2002.
- United States General Accounting Office. *Military Transformation: Army Actions Needed to Enhance Formation of Future Interim Brigade Combat Teams*. [GAO-02-442](#). Washington, DC: GAO, May 17, 2002.
- United States General Accounting Office. *Joint Warfighting: Attacking Time-Critical Targets*. Washington, DC: GAO, November 30, 2001.
- United States General Accounting Office. *Military Transformation -- Army Has a Comprehensive Plan for Managing Its Transformation but Faces Major Challenges*. Washington, DC: GAO November 2001.

Journal Articles

- Benson, Kevin and Christopher Trash. "[Declaring Victory: Planning Exit Strategies for Peace Operations.](#)" *Parameters*, Vol. XXVI, No. 3. Autumn, 1996.
- Bingham, Price. T. "Air Power Targeting Theory: A Key Element in Transformation." *Military Review* 82: 34-39. May-June 2002. Available at: <http://www-cgsc.army.mil/milrev/english/MayJun02/bingham.asp>
- _____. "Seeking Synergy: Joint Effects-Based Operations." *Joint Force Quarterly* No. 30, pp 52-59 Spring 2002. Available online at: http://www.dtic.mil/doctrine/jel/jfq_pubs/1030.pdf
- _____. "Transforming Warfare with Effects-Based Joint Operations." *Aerospace Power Journal* 15:58-66 Spring 2001. Available online at: <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj01/spr01/bingham.htm>
- Butler, Amy. "DOD Urged Not to Forget Benefits of Attrition, Annihilation Strategies." *Inside the Air Force*. 9 June 2000.
- Cebrowski, Arthur K. (Vice Adm, USN-Ret). "The Small, The Fast, And The Many." *NetDefense*. January 15, 2004, Pg. 10.
- Cook, Nick. "Cause and Effect (Briefing: Effects-Based Air Operations)." *Jane's Defence Weekly* 39:52+ June 18, 2003.
- Correll, John T. *Air Force Magazine*, Aug 2000, "Recasting the Vision."
- Crowder, Gary L. "Effects-Based Operations." *Military Technology* 27:16-18 June 2003: 16-25. Available online at: <http://search.epnet.com/direct.asp?an=10390348&db=aph&tg=AN>
- Deptula, Maj Gen David A., USAF, "Air Force Transformation: Past, Present, and Future," *Airpower Journal* Vol. XV, No. 3 ([Fall 2001](#)): 85-91.

- Dubik, James M. *Effects-based Decisions and Actions*. *Military Review* 83: 33-36. January-February 2003.
- Echevarria, Antulio J. II, LTC USA. "Fusing Airpower and Land Power in the Twenty-First Century: Insights from the Army after Next." *Aerospace Power Journal*. Fall 1999, Volume XV, No.4.
- Endersby, Gary and Fulbright Barry. "Effects-Based Airpower." *Airpower Journal* 12:89-98 Winter 1998. Available online at:
<http://www.airpower.maxwell.af.mil/airchronicles/apj/apj98/win98/waywin98.html>
- Finn, Geoff. "Army Stresses 'Joint Expeditionary Mindset.'" *National Defense*. February 2004. Available at <http://www.nationaldefensemagazine.org/article.cfm?Id=1324>.
- Freniere, Robert W., Dickman, John Q., and Cares, Jeffrey R. "Complexity-Based Targeting: New Sciences Provide Effects." *Air & Space Power Journal* 17:95-100 Spring 2003. Also available online at:
<http://www.airpower.maxwell.af.mil/airchronicles/apj/apj03/spr03/freniere.html>
- Haun, Phillip M, Lt Col, USAF. "Airpower versus a Fielded Army: A Construct for Air Operations in the Twenty-First Century." *Aerospace Power Journal*. Winter, 2001, Volume XV, No. 4. AFRP 10-1, 81-88.
- Hill, Jerry C. and Trout Carl R. "Effects-Based Fires: The Future of Fire Support Coordination and Execution." *Field Artillery*, November-December 2000, 6-8.
- Jumper, Gen John P. "Global Strike Task Force: A Transforming Concept, Forged by Experience," *Airpower Journal* Vol. XV, No. 1 ([Spring 2001](#)): 24-33.
- Kagan, Frederick W. "War and its Aftermath." *Policy Review*: Number 120. August and September, 2003. Available from <http://www.policyreview.org/aug03/>.
- Kitfield, James. "About-Face." *National Journal*. January 31, 2004. Available at <http://nationaljournal.com/>.
- Knights, Michael. "USA Learns Lessons in Time-Critical Targeting." *Jane's Intelligence Review*. No. 15: July 2003: 32-34.
- Mann, Edward, COL, USAF, Retired, Endersby, Gary, Lt Col USAF Retired, Searle, Tom. "Dominant Effects: Effects-Based Joint Operations." *Aerospace Power Journal*. 15:92-100 Fall 2001. Available online at:
<http://www.airpower.maxwell.af.mil/airchronicles/apj/apj01/fal01/vorfal01.html>.
- Meilinger, Phillip S. Col, USAF. "Air Strategy: Targeting for Effect." *Aerospace Power Journal*. Winter 1999.
- _____. "Precision Aerospace Power, Discrimination, and the Future of War," *Aerospace Power Journal* Vol. XV, No. 3 ([Fall 2001](#)): 12-20.
- Murdock, Paul. "Principles of War on the Network-Centric Battlefield: Mass and Economy of Force." *Parameters* 32:86-95 Spring 2002. Available online at: <http://carlisle-www.army.mil/usawc/Parameters/02spring/murdock.htm>
- Murray, William S. "[A Will to Measure](#)." *Parameters*. Autumn 2001. Vol XXXI, No. 3: 134-147.

- Roos, John G. *Effects-based Operations: US Air Force Chief [Michael E. Ryan] Assesses a Decade of Transformation*. *Armed Forces Journal International* 138:66+ March 2001. Also available online at:
<http://search.epnet.com/direct.asp?an=4198212&db=aph&tg=AN>
- Roper, Daniel S. "Napoleonic Artillery: The Paradigm of Jominian Mass." *Field Artillery*. July-August 1996: 44-45.
- _____. "Technology: Achilles' Heel or Strategic Vision?" *Military Review*, 77 no. 2. March-April 1997: 87-92.
- Ross, William A. "F2C2 (Future Fires Command and Control) Experiments for Rapid Transformation to Effects-Based Fires." *Field Artillery*. November-December 2000: 6-8.
- Schadlow, Nadia. "War and the Art of Governance." *Parameters*. Autumn 2003: 90-99.
- Smith, Edward A. "Network-Centric Warfare: What's the Point?" *Naval War College Review* 54:59-75 Winter 2001. Available online at:
<http://search.epnet.com/direct.asp?an=4766933&db=aph&tg=AN>
 OR <http://www.nwc.navy.mil/press/Review/2001/Winter/art4-w01.htm>
- Warden, Col John A., III. "The Enemy as a System." *Airpower Journal*, No. 1. [Spring 1995](#), pp. 40-55.
- Wilkes, Bobby J. Col, USAF. "Silver Flag: A Concept for Operational Warfare." *Aerospace Power Journal*. Winter 2001, Volume XV, No.4, AFRP 10-1, pp. 47-56.

Reports, Studies, and Monographs

- Barksdale, Carl A. *The Network Centric Operations-Effects Based Operations Marriage: Can It Enable Prediction of "Higher Order" Effects on the Will of the Adversary?* Newport, RI, Naval War College, 2002. Also available online at:
<http://handle.dtic.mil/100.2/ADA405867>
- Batschelet, Allen W. *Effects-based Operations : A New Operational Model?* Carlisle Barracks, PA, Army War College, 2002. 28 p. Also available online at:
<http://handle.dtic.mil/100.2/ADA404406>
- Beagle, T. W. *Effects-Based Targeting: Another Empty Promise?* Maxwell AFB, AL, School of Advanced Airpower Studies, 2000. Available online at:
<https://research.maxwell.af.mil/papers/ay2001/saastheses/beagle.pdf>
- Bowman, Christopher W. *Operational Assessment: The Achilles Heel of Effects-Based Operations?* Newport, RI, Naval War College, 2002. Also available online at:
<http://handle.dtic.mil/100.2/ADA405868>
- Brown, Michael, May, Andrew, and Slater, Matthew. *Defeat Mechanisms, Military Organizations as Complex, Adaptive, Nonlinear Systems*. Report prepared for the Office of the Secretary of Defense, Net Assessment (McLean, Va.: Strategic Assessment Center, Science Applications International Corporation, 2000), pp. 34-37.
- Burkett, Wendy H. *Assessing the Results of Effects-Based Operations (EBO): The Relationship Between Effects-Based Operations and the Psychological Dimension of Warfare*. Carlisle

- Barracks, PA, Army War College, 2003. 45 p.
Available online at <http://handle.dtic.mil/100.2/ADA414951>
- Cheek, Gary H. *Effects-Based Operations : The End of Dominant Maneuver?* Carlisle Barracks, PA, Army War College, 2002. Also available online at:
<http://handle.dtic.mil/100.2/ADA401019>.
- Cole, Kevin. "*Effecting" Peace: Effects-Based Targeting for Peace Enforcement Operations.* Maxwell AFB, AL: Air Command and Staff College, 2000.
- Deptula, David A. *Firing for Effect: Change in the Nature of Warfare.* Arlington, VA, Aerospace Education Foundation, 1995. 23 p. Doc call no.: M-U 42863-4
- _____. Deptula, David A. *Effects-Based Operations: Change in the Nature of Warfare.* Arlington, VA, Aerospace Education Foundation, 2001. 33 p. Available online at:
<http://www.aef.org/pub/psbook.pdf>
- Foster, H. A. *Organizing for Effect: Assessing the Institutional Machinery Needed to Effectively Conduct Effects-Based Operations.* Quantico, VA, Marine Corps Command and Staff College, 2002. Available online at:
<http://handle.dtic.mil/100.2/ADA404916>.
- Gleeson, Dennis J. and others. *New Perspectives on Effects-Based Operations Annotated Briefing.* Alexandria, VA, Institute for Defense Analyses. Joint Advanced Warfighting Program, June 2001. Available online at <http://handle.dtic.mil/100.2/ADA395129>
- Heaney, Thomas. *Battle Command and Network Centric Warfare: Putting First Things First .* Newport, RI, Naval War College, 2001. Available online at:
<http://handle.dtic.mil/100.2/ADA393569>
- Holl, Michael. *Aerospace Power's Contribution to Humanitarian Assistance Missions: Redefining Effects-based Operations.* Maxwell AFB, AL, Air Command and Staff College, 2001. 50 p. Available online at:
<https://research.maxwell.af.mil/papers/ay2001/acsc/01-056.pdf>
- Horner, John P. *Fire Support Coordination Measures by the Numbers.* Maxwell AFB, AL, School of Advanced Airpower Studies, 1999. Available online at:
<http://handle.dtic.mil/100.2/ADA391805>
- Knouse, Edgar M. *Effects-Based Targeting and Operational Art in the 21st Century.* Newport, RI, Naval War College, 1999. Available online at:
<http://handle.dtic.mil/100.2/ADA363060>
- Kreighbaum, Jay M. *Force Application Planning: a Systems-and-Effects-Based Approach.* Maxwell AFB, AL, School of Advanced Airpower Studies, 1998. Also available online at: <http://handle.dtic.mil/100.2/ADA391343>
- Military Operations Research Society. *Analyzing Effects-Based Operations: Workshop Report.* McLean, VA, Booz Allen Hamilton, 29-31 January 2002. Available online at:
http://www.mors.org/publications/reports/EBO_Report.pdf
- Military Operations Research Society. *Workshop on Analyzing Effects-Based Operations.* McLean, VA, Booz Allen Hamilton, 29-31 January 2002.
http://www.mors.org/meetings/ebo/ebo_final.htm

- Miller, Charles B. *Enhancing the Strategic Application of Effects-Based Operations Concepts*. Carlisle Barracks, PA, Army War College, 2002. Available online at: <http://handle.dtic.mil/100.2/ADA400767>
- Polumbo, H. D. *Effects-Based Air Campaign Planning: The Diplomatic Way to Solve Airpower's Role in the 21st Century*. Colorado Springs, CO; Maxwell AFB, AL, Institute for National Security Studies, 2000. Also available online at: <https://research.maxwell.af.mil/papers/ay2000/affellows/polumbo.pdf>
- Noedskov, K. *Systematizing Effect Based Air Operations*. *Air Chronicles*, May 24, 2000. Available online at: <http://www.airpower.au.af.mil/airchronicles/cc/noedskov.html>
- Record, Jeffrey. *Bounding the Global War on Terrorism*. U.S. Army War College, Strategic Studies Institute, December 2003.
- Saunders-Newton, Desmond and Frank Aaron B. "Effects-Based Operations: Building the Analytic Tools." *Defense Horizons*, No. 19, October 2002. National Defense University, Center for Technology and National Security Policy. Available online at: http://www.ndu.edu/inss/DefHor/DH19/DH_19.htm
- Silvia, Dave. *Synchronization of Air Power Effects: Coming Full Circle Following a Century of Powered Flight*. Newport, RI, Naval War College, 2002. Also available online at: <http://handle.dtic.mil/100.2/ADA410940>
- Steblin, Mark E. *Targeting for Effect : Is There an Iceberg Ahead?* Maxwell AFB, AL, Air War College, 1997. 77p. Also available online at: http://stinet.dtic.mil/cgi-bin/fulcrum_main.pl?database=ft_u2&searchid=101966402619847&keyfieldvalue=ADA399191&filename=%2Ffulcrum%2Fdata%2FTR_fulltext%2Fdoc%2FADA399191.pdf OR <https://research.maxwell.af.mil/papers/ay1997/awc/97-184.pdf>
- United States Army Command and General Staff College. *Predictive Cultural Analysis*. Fort Leavenworth, KS: School of Advanced Military Studies, February, 17, 2004.
- United States Department of Defense. *Effects-Based Operations Briefing*, presented by Col Gary L. Crowder, Plans Director for Strategy Concepts and Doctrine at Air Combat Command, March 19 2003. Briefing on concept of effects based operations, with link to accompanying slideshow. Also available online at: http://www.pentagon.gov/news/Mar2003/t03202003_t0319effects.html
- United States Department of Defense. *Measuring the Effects of Network-Centric Warfare*, report prepared for the Office of the Secretary of Defense, Net Assessment (Arlington, Va.: Booz Allen & Hamilton, 1999), 2-5-2-6.
- United States Department of Defense. *Transforming for Stabilization and Reconstruction Operations*. Ed. Hans Binnendijk and Stuart Johnson. Washington, DC: National Defense University, Center for Technology and National Security Policy. November 12, 2003.
- U.S. Joint Forces Command. *Army, USJFCOM gear up for Unified Quest 2004*. (Suffolk, VA: USJFCOM Public Affairs, Jan. 22, 2004), accessed 1 Feb 04 at <http://www.jfcom.mil/newslink/storyarchive/2004/pa012204.htm>.
- Williams, Brett T. *Effects-based Operations: Theory, Application and the Role of Airpower*. Carlisle Barracks, Army War College, 2002. Available online at: <http://handle.dtic.mil/100.2/ADA400990>.