

Centers of Gravity from the “Inside Out”

By JAN L. RUESCHHOFF and JONATHAN P. DUNNE

For over two decades, U.S. military doctrine has insisted on pinning major aspects of its operational planning processes on Carl von Clausewitz’s concept of the center of gravity (COG). Yet the lack of doctrinal guidance on developing and employing COGs wastes planners’ time and provides few tangible benefits. Fortunately, doctrine’s introduction of *Critical Factors* as the components of COG provides pillars upon which a process of COG identification and implementation can be built.

The purpose of this article is to extend a bridge between COGs and existing doctrinal guidance for operational planning. The concepts introduced in this article are not meant to challenge or change doctrine, but to clarify one of its most essential concepts.

Review of COG

In the 1980s, American doctrine writers refocused on the Soviet army and the potential for war in Europe. As the American military was outnumbered and outgunned on the European continent, a departure from the largely defensive doctrine of the past was necessary. In its place, the Services sought to exploit the combination of mobility and firepower to overcome their numerical inferiority.

In the midst of this renaissance of American military theory, a term seized prominence in U.S. doctrinal publications—*center of gravity*. Clausewitz defined COG as “the hub of all power and movement, on which everything depends.”¹ Victory, the Prussian argued, goes to the commander who focuses his energies against his adversary’s COG while protecting his own.² While the Services may have reshaped Clausewitz’s original concept of COG, the term has become a crucial part of American operational art. Yet the Army and

Marine Corps took different paths to including COGs into their respective doctrines.

In 1986, Army doctrine asserted that the essence of operational art was the identification of the enemy’s COG.³ This theme has continued throughout Army doctrine up through its latest doctrinal revision describing COG as a “focal point” for campaigns and major operations.⁴ While initially suggesting COG provided a method of pitting “strength against strength,” the Army eventually adopted the term *decisive points* as a way of indirectly attacking an enemy’s COG. This indirect approach would apply “combat power against a series of decisive points that avoid enemy strengths.”⁵

Long holding to the importance of pitting strength against weakness, the Marine Corps approached the idea of COG cautiously. Marine doctrine warned there was “danger” associated with using the term COG; declaring the enemy’s COG was not “a source of strength, but a [c]ritical [v]ulnerability (CV).”⁶

The 1989 edition of the Marine Corps Fleet Marine Field Manual (FMFM) 1, *Warfighting*, described CVs simply as “where and when we can hurt [the enemy] most.”⁷ The Marine Corps eventually relented to the idea of COGs. In the revision of the manual, the Marine Corps accepted COGs into its doctrine—but only if used as a partner to an enemy’s critical vulnerabilities.

Whatever term the two Services use to describe the focus for indirectly attacking an adversary’s COG, determining this point is admittedly not a simple process. The Army mandates a “thorough and detailed” analysis to determine its decisive points, but provides little insight on a process for that analysis.⁸ The Marine Corps has been even more blunt, noting the identification of a CV may be so difficult that the Marine Corps may need to “adopt the tactic of exploiting any and all vulnerabilities” until uncovering a decisive opportunity.⁹ It is interesting that doctrine would essentially disregard the principle of economy and suggest that one “hit anything

that looks vulnerable and hope you get lucky.” A more deliberate process was needed to identify this point.

Critical Factors

In 1996, Dr. Joe Strange, a professor at the Marine Corps War College, set out to write a 13-page paper to link the Marine doctrinal terms of *critical vulnerability* and *center of gravity*.¹⁰ He ended with a full-length monograph and a construct that has been adopted by militaries around the globe. Dr. Strange’s framework introduced *critical capabilities* (CCs) and *critical requirements* (CRs) as the connective tissue between a CV and COG. By exploiting a CV, forces can deny a CR necessary for an enemy’s CC. As the CCs are degraded or denied, the enemy’s COG is also degraded or denied.¹¹

In 2002, Strange’s concept was adopted in U.S. Joint Forces Doctrine with the release of Joint Publication (JP) 5–00.1, *Joint Campaign Planning*,¹² and later in the 2006 edition of JP 3–0, *Joint Operations*, that referred to the individual components of COG—CCs, CRs, and CVs—as “Critical Factors.”¹³ North Atlantic Treaty Organization (NATO) doctrine also included this approach in its 2006 version of Allied JP 5–0, *Allied Joint Doctrine for Operational Planning*.

Neither the Army nor the Marine Corps, however, has revised its planning or operational doctrine to include a discussion of Critical Factors. This omission is unfortunate, as Critical Factors Analysis (CFA) provides a sound analytical framework to assist planners in the analysis and identification of COGs and to assist in operational planning.

Identifying COGs

The Problem. The American military’s doctrinal guidance is insufficient in providing commanders and their staffs with a process to select a center of gravity. Planning teams can take hours—if not days—arguing over what is and is not the enemy’s COG. This contest of wills is often decided by

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whoever is the strongest personality on the planning team, not through any established analytical process.

More troubling, without an objective approach to determine a COG, planners are vulnerable to faulty COG analysis. As Army Field Manual 3-0, *Operations*, warns, “Faulty conclusions drawn from hasty or abbreviated analyses can adversely affect operations, waste critical resources, and incur undue risk.” The question, therefore, is how do planners select the correct COG?

The Army/Marine Corps’ latest Intelligence Preparation of the Battlefield (IPB) doctrine states, “Threat/adversary templates . . . aid in the initial identification of the threat’s/adversary’s centers of gravity.”¹⁴ This essentially leaves a planner with a definition of COG in one hand and an enemy situational template in another—hoping he will make the right guess.

In 2002, the interim publication JP 5-00.1 provided an in-depth description of how COGs could be determined using Strange’s framework.¹⁵ However, JP 5-0, *Joint Operation Planning*, superseded JP 5-00.1 in 2006 and represented a step backward—deleting much of the guidance of the previous manual. JP 5-0 states that COGs are derived from systems analysis (see figure 1), but provides little guidance on the process of determining them. Instead, the manual refers readers to the Joint IPB manual for further guidance.¹⁶ Yet any hope for concrete guidance in the Joint IPB manual quickly becomes forlorn. The manual’s guidance is to analyze the various systems and determine from which elements the adversary derives its “freedom of action, physical strength or will to fight.”¹⁷ In other words, we take a definition in one hand and an enemy situational template in another, and hope we pick the right COG—and we are right back to the initial problem.

To its credit, JP 5-0 continued to incorporate Strange’s concept of Critical Factors. Unfortunately, the manual depicted the process as a sequential, linear analytical method beginning with identifying a COG.¹⁸ This linear, left-to-right approach is reinforced by other doctrinal and academic publications. These include a Joint Forces Staff College publication¹⁹ (see figure 2) and guidance in the U.S. Joint Force Command’s Joint Targeting Handbook, which states that the process “begins with the COG as a source of power.”²⁰

The problem with this left-to-right approach—beginning with identifying the

COG—is that planners are once again left without any *process of determining* a COG. While the analysis of the Critical Factors provides the planning team with greater details to assist in targeting and operational planning, the difficulty involved in selecting the initial COG leaves the participants wanting to disassociate themselves from the process altogether. There is also no safeguard against picking the wrong COG.

The Solution. Too many readers of Dr. Strange’s monograph seem to have missed his advice that the process does not “have to be conducted in a precise or rigid sequential manner.”²¹ Proper analysis of a COG does not start with its identification. It is best accomplished from an “inside-out” approach of first identifying objectives and then the Critical Factors—namely the critical capabilities—that support the objectives (see figure 3).

In his 2004 *Military Review* article, Colonel Dale Eikmeier, USA, acknowledged the importance of first identifying objectives, then identifying Critical Factors.²² Yet the Navy’s Planning Manual is the only doctrine that calls for identifying Critical Factors before COGs—although the Navy focuses on what it calls “critical strengths” to identify COGs.²³ Why Critical Factors—particularly critical capabilities—should precede COGs is best explained by reviewing the definitions of *critical capability*:

- a means that is considered a crucial enabler for a center of gravity to function as such and is essential to the accomplishment of the specified or assumed objective(s)²⁴
- primary abilities that merit a center of gravity to be identified as such in the context of a given scenario, situation, or mission.²⁵

While the joint definition reveals that critical capabilities are what allow a COG to function as such, Strange’s use of the term *identified* gets to the point of the issue. It is through an adversary’s CCs that an analyst may identify a COG. While COGs may seem amorphous, capabilities are much more concrete and discernable. Joint and Service doctrine has long included the identification of enemy capabilities as a crucial step in the IPB process. Armed with a list of capabilities necessary for a force to achieve its objectives, an analyst may now make an assessment of what may be providing the “source of power” to these capabilities—the COG.

Figure 1. JP 5-0 Concept of COG

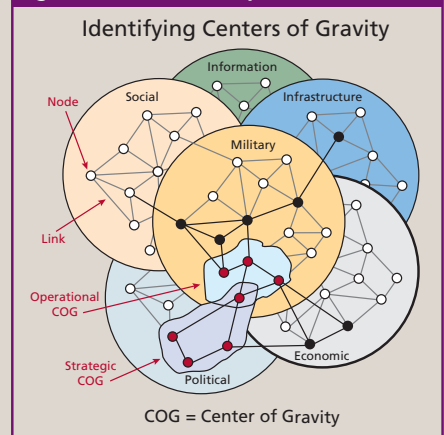
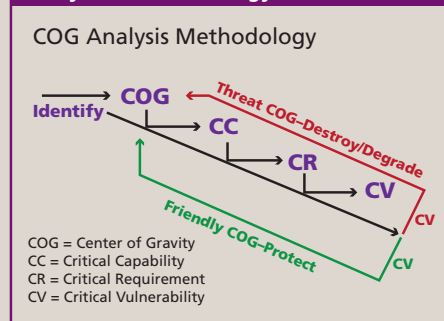


Figure 2. Depiction of a Linear Analytical Methodology

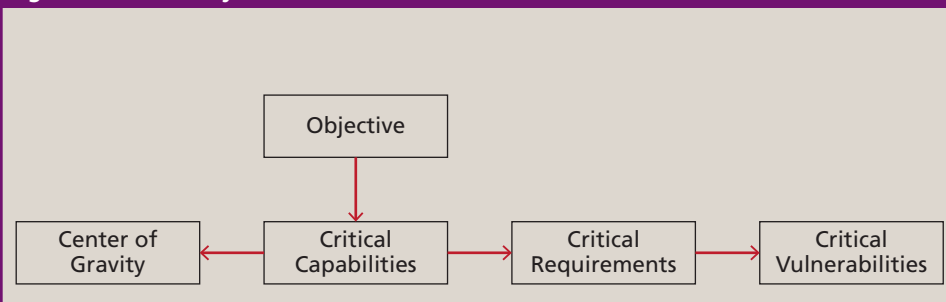


The “Unspecified” COG

While there may be times when a COG is abundantly clear, often the true COG will be difficult to determine. Take the example of a staff that identifies 10 CCs. The staff attempts to find a singular source of power for each of the 10 CCs believed vital for the accomplishment of the enemy’s mission. After determined analysis, their best COG candidate can only satisfy seven of the CCs. Another source provides the last three. Are there, therefore, two COGs?

The answer may very well be yes, but it depends upon which doctrine the staff is following. Despite the individual Services’ acceptance of multiple COGs, joint doctrine is clear that there is only one COG for each level of war.²⁶ So what should a staff do if they have two possible COGs and are operating under joint doctrine—constricting the staff to only one COG? Should the staff continue looking for a better COG candidate? Should they simply discard the three CCs that cannot be linked to the proposed COG?

Figure 3. COG Analysis from the “Inside Out”



We recommend the staff do neither. The objective of COG analysis is not to provide a magic name of a COG by which the commander may speak and slay his foe. The objective is to identify weaknesses the commander may exploit that will uncover and eliminate the foe's ability to resist.

If the staff is able to identify and then devise an operational plan to exploit CVs, thereby denying CRs and eliminating the abilities of a CC, is not the force still attacking an “unspecified” COG? We believe this to be the case. The time spent in a fruitless pursuit of the perfect description of the enemy's COG is better used providing detail to the Critical Factors.

Operational Planning

Working “To the Right of CCs.” Regardless of whatever is named the COG—or even if one is specified at all—with the identified CCs, the analyst may begin identifying CRs and CVs. While CCs are the critical actions or functions—think verbs—necessary for the enemy to meet his objectives, CRs are assets or conditions—think nouns—required to enact the CCs. For instance, if the CC is *deliver indirect fires*, the CRs may be *observers, munitions, artillery pieces, gun crews, radio communications, and being within range of desired targets*.

Critical vulnerabilities identify the aspects of CRs that are vulnerable or already deficient. Too often, analysts simply restate vulnerable CRs as CVs. However, to get the most out of the analysis, the planner should attempt to determine not only *if* a CR is vulnerable, but *how* the CR is vulnerable.

While the analyst will usually identify CRs and CVs after determining CCs, the process does not always need to be in this order. There may be times when discovering a vulnerability or requirement may result in the identification of a CC. For example, an intelligence report reveals that an adversary has purchased amphibious landing craft.

From this report, an analyst could assess that the landing craft is a possible CR for a new CC—conducting amphibious operations. In turn, this may indicate that the adversary may also be adjusting his objectives.

While “conventional” military examples are fairly straightforward, the CFA process is also applicable to counterinsurgency (COIN) operations. The complexity of the COIN battlefield demands more detailed analysis. In conducting a thorough analysis of an adversary's CRs, the planner may run into a Russian “nesting doll” effect of subnested requirements. By subnesting requirements, the planner keeps intact the linkage of CRs and CCs. A sub-CR could support more than one CC or CR.²⁷ Identifying these multiple relationships allows planners to formulate priorities based upon which targets would have the greatest impact on the adversary. The CFA framework also facilitates identifying nonlethal targeting opportunities—stopping insurgent attacks—that would normally be associated with lethal targeting efforts.

CFA applied to COIN demonstrates how this type of analysis can contribute to planning across lines of operation and in depth of time and space. From this example, we realize that CFA is essential in the development of operations. The importance of determining how to attack a COG is, according to joint operations doctrine, the “essence of operational art.”²⁸ One of the key operational elements in this planning is decisive points (DPs). Interestingly, while the Army fully embraces DPs in its doctrine, Marine Corps doctrine uses the term sparingly, emphasizing CVs instead. Yet both Services use their respective terms for the same purpose: to provide an indirect means to attack an enemy's center of gravity.

So are DPs restated CVs? Some argue that this is the case. Lieutenant General Paul Van Riper, USMC (Ret.), wrote, “The terms

vulnerability and later *critical vulnerability* entered the military vocabulary in the late 1980s as sort of a synonym for decisive point.”²⁹ Joint doctrine seems to echo this when it states, “Decisive points can be thought of as a way to relate what is ‘critical’ to what is ‘vulnerable.’”³⁰

The link between DPs and Critical Factors is further strengthened by the joint definition that states a DP can be a geographic place, specific key event, Critical Factor, or function. The examples given in JP 3–0—airbases, overflight permissions, civilian infrastructure³¹—all describe elements that could be CRs to an adversary's CC. JP 5–0 seems to close the discussion when it states, “Understanding the relationship between a COG's critical capabilities, requirements, and vulnerabilities can illuminate direct and indirect approaches to the COG. It is likely that most of these Critical Factors will be decisive points.”³²

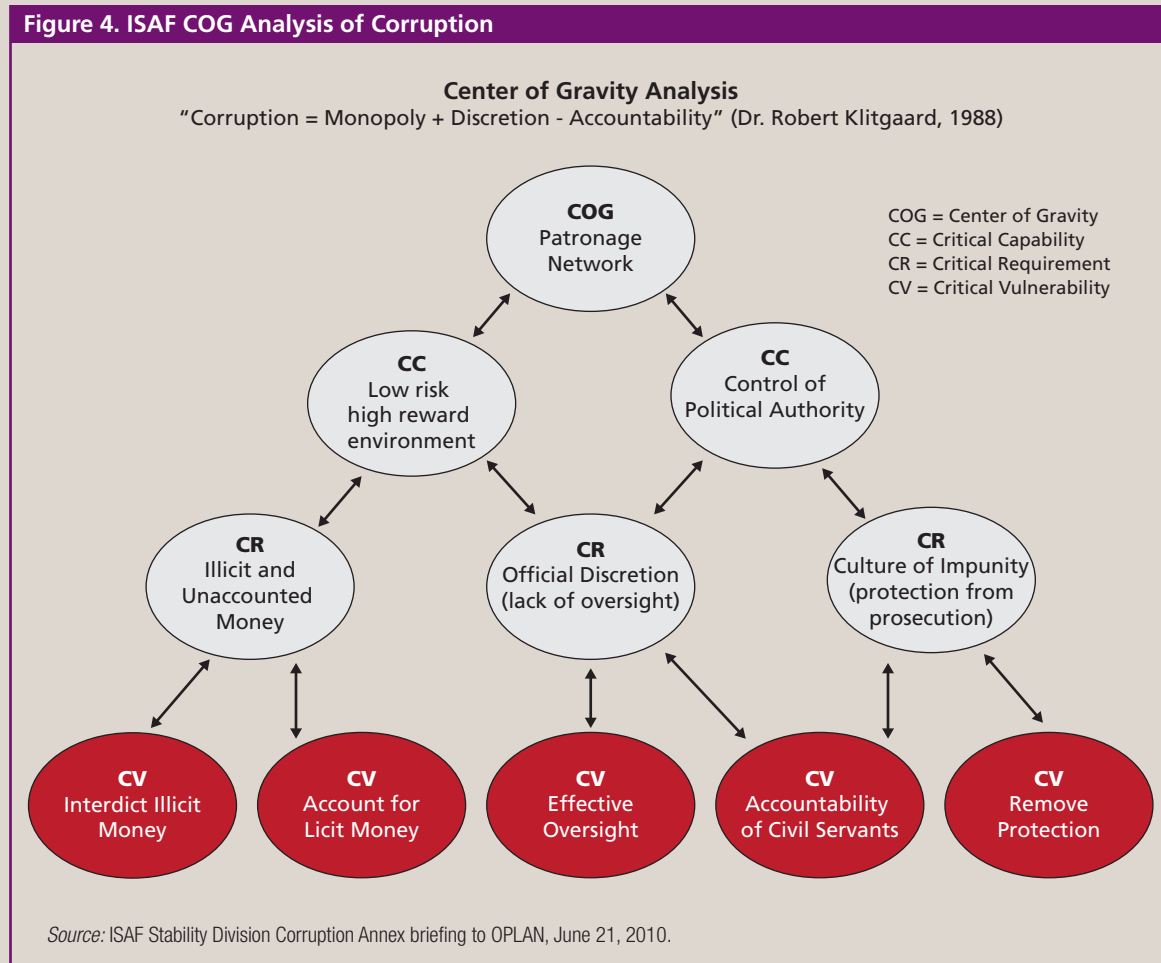
Yet it may be more helpful to follow NATO doctrine's lead: “Decisive Points are logically *derived* from Critical Requirements and Critical Vulnerabilities.”³³ Planners derive DPs through CFA, but DPs are not synonymous with Critical Factors.

Planners identify the Critical Factors of their adversaries, their own forces, and third parties. They then determine which vulnerable CRs need to be affected—attacked or protected—in order to achieve their own objectives and endstate. Just as CVs describe how a CR may be vulnerable, DPs describe the key locations, systems, capabilities, or events from which a commander may exploit or protect the vulnerabilities that CFA identifies. Essentially, DPs are the springboard by which planners effect the CVs necessary to achieve one's objective.

It is easy to focus on the adversary's COG, but planners must not disregard their own COG. By applying the same CFA model to friendly forces, planners will identify CCs necessary to accomplish their objectives, CRs necessary to enable those CCs, and how they might be deficient or vulnerable. Thus, some DPs may be identified that protect or reinforce friendly CRs at the same time planners use DPs to affect the CRs of their adversaries.

Third Party Actors. As observed in current conflicts, modern forces do not only share the battlefield with one's adversaries. Other parties such as nongovernmental organizations, the host nation, various tribes, and

Figure 4. ISAF COG Analysis of Corruption



criminal groups all contribute to the operational environment. An evaluation of each of these third parties using CFA aids the staff's ability to understand the systems of each group and how they interact.

The concept of evaluating civilian entities based upon their capabilities is already captured in Service doctrine. The Army/Marine Corps IPB manual expresses the need to identify the capabilities when assessing civil considerations.³⁴ Identifying these groups, their objectives, and associated Critical Factors—including capabilities—necessary to achieve their endstate provides the operational planner with vital analysis of the operational environment.

Planners may find critical requirements are shared by more than one party. There also may be sets of inverse relationships of Critical Factors among the different groups where the presence of a particular condition may be a CR for one party and the absence of that particular condition is a CR of another.

Identifying these shared and inverse Critical Factor relationships allows opera-

tional planners to identify and prioritize DPs that would have the greatest impact on neutralizing opposing Critical Factors and reinforcing Critical Factors tied to shared objectives within the operational environment. By applying CFA to third party actors, planners can begin to determine which party's CRs they may choose to reinforce and protect and whose CRs they wish to disrupt in order to meet their own objectives.

Future Critical Factors. Much of the emphasis in American campaign planning doctrine is focused on identifying an adversary's present vulnerabilities and capabilities. Unfortunately, the exclusive focus on present capabilities stifles our ability to develop a plan poised to react to future threats—much less prevent those future threats from emerging. The planning for the transition between phase three and phase four operations is where the concept of Future Critical Factors may have the most relevance.

Through phase three, planners are usually focusing on an enemy with a relatively well-defined objective and set of Critical

Factors. The staff dutifully identifies the decisive points necessary to attack their adversary's COG and sequences them into their operational planning, which will culminate with defeat of the adversary's COG and accomplishment of friendly objectives.

With a defeated adversary, there could be the temptation to dismiss the use of CFA to identify DPs in phase four. Yet just as planners use phases to denote a change in objectives, it is important to assume a defeated adversary's objectives have also changed. Likewise, it is possible that other groups may see the defeat of our adversary as an opportunity to act on their objectives—which may not be congruent with our own—even if they do not yet have the capabilities to act toward achieving their objectives.

The lack of capabilities does not invalidate the use of CFA. Rather, the staff should focus on the CCs that their adversary would need to develop to reach their objectives. The CRs become the conditions, resources, and means by which an adversary would develop their necessary CCs.

Focusing on future CCs allows the planning team to anticipate problems during the transition to phase four and to be proactive in dealing with these challenges before they are able to impact their own CVs—preventing achievement of the endstate.

Current Operations

One of the best examples of how CFA is contributing to current operations is the International Security Assistance Force (ISAF) efforts to support the government of Afghanistan in combating corruption. Despite sincere proclamations of the government's leaders desiring to clamp down on corruption, the social fabric of the country complicates confronting some of the country's most malign actors and their networks directly. ISAF planners realized an indirect approach to corruption that changed the conditions in which these networks operated was needed. The best way to do this was to attack the CVs and CRs of the patronage networks.³⁵

The planners started with a simple COG analysis, which concluded with the identification of five critical vulnerabilities (see figure 4). The planners admit their initial COG analysis was too simplistic and note that several of the Critical Factors are not consistent with doctrinal definitions. However, what sets this analysis apart from so many other COG analysis efforts is the planners actually *used* this analysis to help guide their operational pursuits.

For each of the CVs, planners identified actions by which these could be influenced. For example, to influence the CV Interdict Illicit Money, planners identified providing better border control and instituting merit-based hiring as potential actions to be taken. These and other actions were designated as decisive points and arrayed in a synchronization matrix depicting the sequence in which they were to be engaged.

In some cases, the best way to influence the malign actor network's COG was to reinforce a CR of the Afghan government. To help make this distinction, the decisive points were segmented into three categories: ISAF Can Do, ISAF Can Facilitate, and ISAF Can Advocate. The categories were a realization that not only did the COG of malign actor networks need to be considered, but also that the COGs of ISAF and the Afghan government needed to be considered—utilizing the concept of third party actor CFA described earlier.

While these initial analyses are simplistic, the process has continued to add more detailed analysis. In August 2010, the ISAF Joint Command (IJC) provided a mission analysis briefing on its anticorruption efforts. The briefing detailed 27 CCs and 77 CRs that IJC found in its COG analysis of malign networks and friendly forces. A number of the associated CVs were identified as being exploitable to achieve decisive conditions.³⁶

Operational Design

Operations in Iraq and Afghanistan have prompted spirited discussions pitting operational planning against operational design—in many cases, arguing traditional planning processes are outdated when facing the complexities of the modern battlefield. While the previous segments in this article have demonstrated how Critical Factors Analysis can be a significant contributor to operational planning, the question may be asked: what is CFA's applicability to operational design?

If existing doctrine is to be used as a guide, CFA is applicable to operational design. JP 5-0 states, "One of the most important tasks confronting the [joint force commander's] staff in the operational design process is the identification of friendly and adversary COG."³⁷ In fact, the discussion of COG and Critical Factors occurs in JP 5-0's design chapter, not its planning chapter. The Army has long held COGs are elements of operational design, reinforced in the Army's newest version of FM 5-0.³⁸ Even the Army Training and Doctrine Command's pamphlet on operational design specifically speaks of CCs and CRs in its section on mission analysis.³⁹

Beyond doctrine, CFA's utility in operational design is illustrated by the ISAF example. The ISAF and IJC staff has used CFA to help craft the foundation of its anticorruption campaign. It was no accident that the IJC briefed their anticorruption CFA results under the banner of "operational design."⁴⁰ So perhaps the question is not whether CFA is applicable to operational design, but how it should be applied.

CFA assists in identifying options by which forces can engage an adversary. These options include both lethal and nonlethal methods. They may be for immediate execution or sequenced far in the future. They may be prioritized by which points impact the most adversary capabilities or by those that aid an ally while harming a foe. But

CFA is not a crystal ball that tells a commander that engaging a potential adversary is consistent with the commander's strategic endstate. Other tools in design's framing process may be helpful in assisting a commander with that judgment. However, once a commander's endstate is defined, CFA is a powerful tool in helping a commander and staff in campaign design and translating that design into action.

Over the past 20 years, American military doctrine has adopted and adapted Clausewitz's concept of center of gravity into its own operational art. However, guidance for identifying COGs and the points by which commanders can indirectly attack those COGs has been elusive in American doctrine. Critical Factors Analysis provides a clear, analytical method of determining the points that American forces should affect—a far cry from recent guidance that in essence suggested Marines should "hit anything that looks vulnerable and hope they get lucky."

CFA is not a process that stands alone in the operational process. Rather, it is the connective tissue between many other doctrinal processes. While COG analysis may once have been no more than an exercise in putting ideas on a PowerPoint slide, CFA provides the staff with a continuous, iterative process that capitalizes on COG analysis to help design campaigns and drive operations.

CFA provides a tool to identify what is critical about one's adversary or third party and to determine where commanders can best affect that point through both lethal and nonlethal means. A better understanding of Critical Factors Analysis within our doctrine will allow staffs to develop plans that are both more effective and efficient. **JFQ**

NOTES

¹ Carl von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 485–486.

² *Ibid.*, 595–596.

³ Field Manual (FM) 100-5, *Operations* (Washington, DC: Headquarters Department of the Army, 1986), 179–180.

⁴ FM 3-0, *Operations* (Washington, DC: Headquarters Department of the Army, 2008), 6–8.

⁵ *Ibid.*, 5–10.

⁶ Fleet Marine Field Manual (FMFM) 1, *Warfighting* (Washington, DC: Headquarters Department of the Navy, 1989), 85.

⁷ *Ibid.*, 36.

⁸ FM 3-0 (2008), 6–8.

- ⁹ FMFM 1, 36.
- ¹⁰ Joseph L. Strange, interview with authors, February 12, 2008.
- ¹¹ Joseph L. Strange, "Centers of Gravity & Critical Vulnerabilities: Building on the Clauswitzian Foundation So That We Can All Speak the Same Language," *Perspectives on Warfighting 4*, no. 2 (1996), 3.
- ¹² Joint Publication (JP) 5-00.1, *Joint Campaign Planning* (Washington, DC: Joint Chiefs of Staff, 2002), II-6—II-10.
- ¹³ JP 3-0, *Joint Operations* (Washington, DC: Joint Chiefs of Staff, 2006), IV-10.
- ¹⁴ U.S. Army/U.S. Marine Corps, FM 2-01.3/ Marine Corps Reference Publication 2-3A: *Intelligence Preparation of the Battlefield/Battlespace* (Washington, DC: Headquarters Department of the Army/Headquarters Department of the Navy, 2009), A-1.
- ¹⁵ JP 5-00.1, II-6—II-10.
- ¹⁶ JP 5-0, *Joint Operation Planning* (Washington, DC: The Joint Staff, 2006), IV-8—IV-15.
- ¹⁷ JP 2-03.1, *Joint Tactics, Techniques, and Procedures for Joint Intelligence Preparation of the Battlespace* (Washington, DC: Joint Chiefs of Staff, 2000), II-45.
- ¹⁸ JP 5-0, IV-11, IV-13.
- ¹⁹ Joint Forces Staff College, *Campaign Planning/Operational Art Primer AY 07: Joint Operation Planning Process* (Norfolk, VA: National Defense University, 2007), 58.
- ²⁰ Joint Warfighting Center, *Joint Fires and Targeting Handbook* (Suffolk, VA: U.S. Joint Forces Command, 2007), I-26.
- ²¹ Strange, *Centers of Gravity & Critical Vulnerabilities*, 141.
- ²² Dale C. Eikmeier, "Center of Gravity Analysis," *Military Review* (July–August 2004), 4.
- ²³ U.S. Navy Warfare Publication 5-01, *Navy Planning* (Washington, DC: Headquarters Department of the Navy, 2007), 2-8, annex C.
- ²⁴ JP 3-0.
- ²⁵ Strange, *Centers of Gravity & Critical Vulnerabilities*, 3.
- ²⁶ JP 3-0, IV-10.
- ²⁷ Developed based upon email discussions between Dr. Strange and authors in September 2009.
- ²⁸ JP 5-0, IV-18.
- ²⁹ Paul K. Van Riper, *Planning For and Applying Military Force: An Examination of Terms* (Carlisle Barracks, PA: Strategic Studies Institute, 2006), 10.
- ³⁰ JP 3-0, IV-12.
- ³¹ Ibid.
- ³² JP 5-0, IV-16.
- ³³ North Atlantic Treaty Organization (NATO), Allied Joint Publication 5, *Allied Joint Doctrine for Operational Planning* (Brussels: NATO Standardization Agency, 2006), 3-11. Emphasis added.
- ³⁴ FM 2-01.3/MCRP 2-3A, 3-15.
- ³⁵ Email interview with Nathan Hoepner, who served as the Anti-Corruption Officer in the International Security Assistance Force (ISAF) Stability Division, September 10, 2010.
- ³⁶ ISAF Joint Command (IJC), Anti-Corruption Analysis Brief to CJIATF-SHAFAFIAT, August 24, 2010, slides 31-39.
- ³⁷ JP 5-0, IV-8.
- ³⁸ FM 5-0, *The Operations Process* (Washington, DC: Headquarters Department of the Army, 2010), D-1.
- ³⁹ U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-5-500 (Fort Monroe, VA: TRADOC, 2008), 28.
- ⁴⁰ HQ IJC, slides 31-39.

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Moving Heaven and (Rare) Earth

The Pentagon's Office of Industrial Policy is preparing to release the results of a year-long study that concluded that China's monopoly on rare earth minerals does not pose a threat to U.S. national security. China produces 97 percent of the world's rare earths, a group of 17 metals used in the production of military equipment such as radar, night-vision goggles, and precision-guided bombs. However, worldwide uncertainty about China's intention to reduce exports of the materials has prompted several countries to move toward ending their dependence on Chinese production. Japan is planning to mine rare earth minerals in Vietnam, and India is accelerating geological surveys and mapping of its own possible reserves. The Pentagon study reportedly suggests that loans and incentives might be offered to U.S. providers of rare earth minerals to bolster domestic supply.

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