Marine amphibious assault vehicles maneuver back to USS *Tortuga* at Hat Yao Beach, Krabi Province, Thailand, as part of joint/combined exercise Cobra Gold 2012 (U.S. Marine Corps/Courtney White)

Godzilla Methodology

Means for Determining Center of Gravity

By James P. Butler

What are enemy force capabilities? Where does the enemy derive its strength? What are the enemy's objectives? Combatant commanders are often tasked with identifying which enemy forces will need to be attacked, destroyed, or neutralized in order to achieve established military objectives. These are some of the questions combatant commanders and their staffs need to address in planning military operations.

One of the terms commonly used while conducting an analysis of enemy force capabilities is *center of gravity*. Military analysts and historians commonly refer to a force or capability as the "enemy center of gravity," meaning that this force is of such strength that it will need to be addressed (attacked, destroyed, or neutralized) to achieve the objective of the operation. Although use of this term is common, seldom does anyone offer an explanation for how to determine the center of gravity. How does a military planner or analyst determine the "it"? How does a military commander determine his own center of gravity so he can protect it? This article attempts to identify a methodology for determining centers of gravity.

The term *center of gravity* first appeared in Michael Howard and Peter Paret's translation of Carl von Clausewitz's immortal discussion of warfare *On War*.[1] Clausewitz actually used the German term *Schwerpunkt* to describe "that area where the greatest

Dr. James P. Butler is a Professor of Joint Military Operations at the Naval War College.

concentration of enemy troops can be found."[2] In the English translation of the book, *center of gravity* is defined as "the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed."[3] This definition indicates that a center of gravity is not just any concentration of military strength, but the source of strength that must be attacked.

Planners and analysts of modern warfare expend great time and energy analyzing enemy force capabilities to prepare for military operations. Where does the enemy derive its strength? What is the enemy's source of power? Analysis may reveal that a particular leader is the source of power at the strategic level of war or that an elite division or army component is the source of power at the operational level.[4] These sources of power where the enemy derives its strength are commonly referred to as centers of gravity.

Joint doctrine defines *center of gravity* as "a source of power that provides moral or physical strength, freedom of action, or will to act."[5] Joint doctrine also specifies that centers of gravity may be found at all three levels of war (strategic, operational, and tactical) and that they should be nested, meaning the destruction of an operational-level center of gravity should have a major impact on the strategic center of gravity. For example, destruction of an operational-level center of gravity (for example, an elite army division) will impact the strategic center of gravity (the nation's will to fight).

Milan Vego, one of the foremost theorists on operational warfare, emphasizes the importance of identifying the center of gravity and defines it as "a source of massed strength—physical or moral—or a source of leverage whose serious degradation, dislocation, neutralization, or destruction would have the most decisive impact on the enemy's or one's own ability to accomplish a given political/military objective."[6] The value of Vego's definition is that he addresses three key aspects of a center of gravity. First, he identifies the center of gravity as a source of physical or moral strength; he then indicates that this source of strength should be degraded, dislocated, neutralized, or destroyed; and finally he indicates that the purpose of this destruction is to achieve a political or military objective. If one were to look at Operation *Desert Storm* in August of 1990 for an example of center of gravity, analysis would identify Saddam Hussein and his inner circle security apparatus as the enemy strategic center of gravity and the Republican Guard as the operational center of gravity.[7] Although Saddam had multiple critical strengths (for example, an integrated air defense system, land-based ballistic missiles, missile-armed surface combatant ships, and sea mine inventories and delivery platforms) available during this operation, the Republican Guard was the source of power used to achieve his objective of occupying and holding Kuwait. That was the force the allies needed to degrade, neutralize, or destroy to prevent Saddam from achieving his operational objective of defeating or neutralizing the coalition force attempting to liberate Kuwait, which was linked to his strategic objective of retaining Kuwait as a 19th province.[8]

Why Is This Important?

Commanders need to effectively employ their forces in order to enhance their ability to achieve objectives. The strength of forces needs to be applied toward achieving objectives, not wasted on secondary, insignificant actions. Many of the principles of war directly apply in determining the importance of centers of gravity.[9] For example, the commander should direct the operation toward a clearly defined goal (which emphasizes the principle of *objective*). The commander should also concentrate the effects of combat power at the most advantageous place and time (emphasizes the principle of *mass*) and minimize the expending of combat power on secondary efforts (emphasizing *economy of force*).[10] Although all the principles of war can be addressed to varying degrees in this way, their relevance is not as direct.

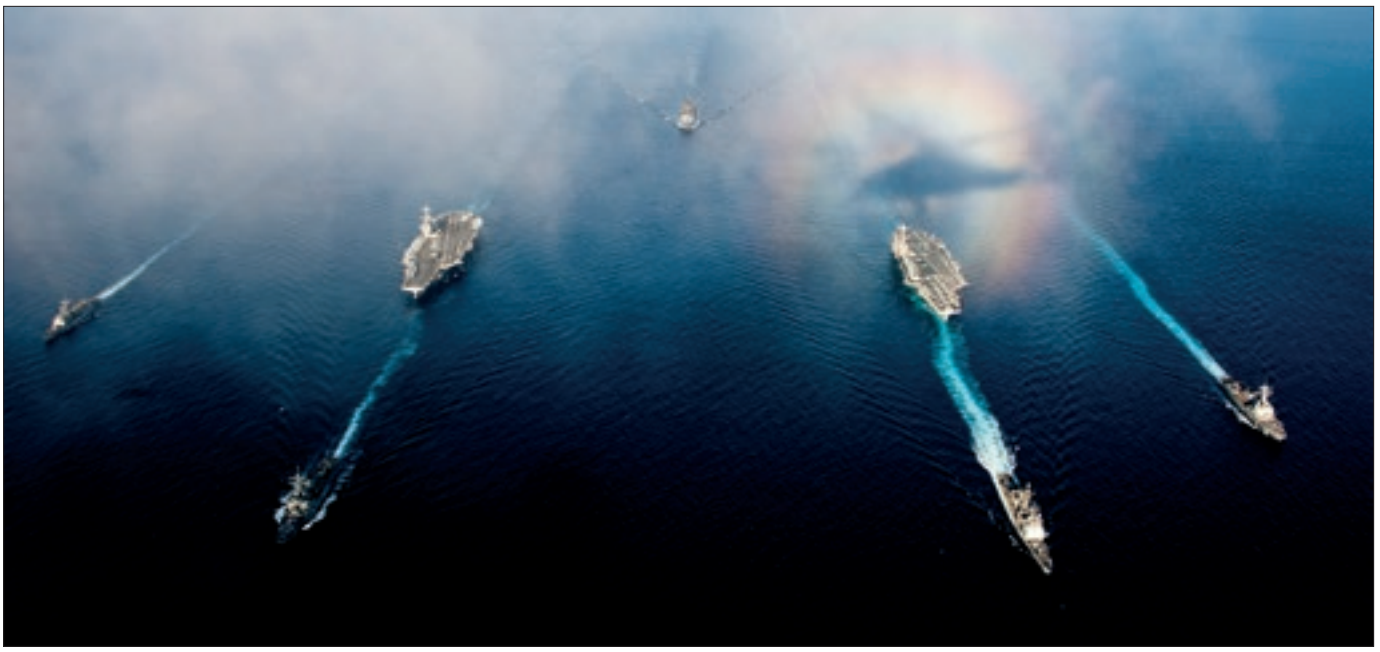
Time is also a critical element in warfare. The efforts of the commander should be synchronized toward achieving the objective in the shortest possible time. To be successful in warfare, commanders need to know what to attack (the enemy center of gravity) and what to defend (the friendly center of gravity). Rapidly attacking the enemy center of gravity may be a determining factor in the outcome of war.

For years, commanders and their staffs have struggled to correctly identify centers of gravity. If an enemy has multiple forces that are strong and formidable, how does a planner determine which one is the center of gravity? For example, enemy sources of strength may include a strong army, superior navy, and formidable air force. Which force should commanders devote their maximum effort toward attacking, neutralizing, or destroying?

Center of Gravity Analysis

In answering these questions, Vego proposes that commanders and their staffs conduct an analysis of objectives and the military situation to determine centers of gravity. The purpose of analyzing the military situation is to determine critical factors, which are things "considered essential for the accomplishment of the specific military objective."[11] Critical factors can be tangible (physical things that can be measured or touched) or intangible (abstract things that are difficult to measure). For example, in measuring the tangible aspects of an army division, one could count the number of troops or tanks or artillery pieces assigned to the unit. Intangible factors of the army division might include a discussion of unit morale, training, or warfighting ability.

In addition to identifying tangible and intangible factors, Vego proposes dividing critical factors into two categories: critical strengths and critical weaknesses. *Critical strengths* are "primary sources of physical or moral potential/power or elements that integrate, protect, and sustain specific sources of combat potential/power."[12] Determination of what forces are critical is based on the good judgment and experience of commanders and their staffs. Elements are deemed critical strengths if they affect or potentially affect accomplishment of the objective. *Critical weaknesses* are sources of power, essential for accomplishing the objective,



USS *John C. Stennis* and USS *George Washington* in Andaman Sea with their carrier strike groups (U.S. Navy/Kenneth Abbate)

that are grossly inadequate to accomplish the mission.[13] At the operational level of war, a force might be considered as a *critical weakness* if it were necessary to accomplish the objective and it was considered to be deficient in some aspect such as mobility, firepower, doctrine, morale, or training. In determining critical strengths and weaknesses, it is essential to keep military objectives in mind. Consideration should be given only to those elements (critical strengths or critical weaknesses) that have some effect on accomplishing the objective.

Continuing to follow Vego's analytical construct, other factors to be considered are those that are vulnerable to attack. Those elements (critical strengths or critical weaknesses) open to attack or exploitation because of some deficiency are identified by Vego as *critical vulnerabilities.*[14] It is often easier to identify elements considered critical weaknesses as critical vulnerabilities because their deficiency may lend itself to the reason the force is vulnerable to attack. For example, an infantry battalion (composed of approximately 850 men) might be considered a critical weakness because it does not possess the ability to defend itself from attack from the air.[15] This same deficiency might lead those conducting the analysis to consider this force a critical vulnerability if the attacking force had the ability to exploit this vulnerability. On the other hand, identification of critical strengths as critical vulnerabilities is often more difficult. Determination of vulnerabilities in elements considered critical strengths is possible, especially if one considers attacking logistic support or sustainment requirements. For example, if a carrier strike group (a naval force composed of a carrier and multiple cruisers, destroyers, frigates, and submarines) is identified as a critical strength, its vulnerability may be its logistic support. Rather than attacking the carrier strike group directly, an enemy might attack this force indirectly by targeting its supply ships.

Having identified critical strengths, critical weaknesses, and critical vulnerabilities, the next step in determining center of gravity is to look at the list of elements considered critical strengths. One of the elements on that list is the center of gravity, a critical strength that is essential for achieving the objective. This is where the analysis could lead to problems and errors—the misidentification of the center of gravity is a common mistake. The center of gravity may not be the strongest or largest force on the critical strength list. Reasoning must be employed to determine which critical strength is necessary to achieve the objective.

How does one know if he has selected the correct center of gravity? Even if one explicitly followed Vego's recommendation for conducting an analysis of force capabilities, one could still select the wrong element on the critical strength list. This could be a costly error if forces were wasted attacking the wrong center of gravity. The Godzilla Methodology was developed to resolve this problem and assist military planners in determining which element on a list of critical strengths is the correct center of gravity.

The Godzilla Methodology

Since Godzilla first terrorized Japan in Ishiro Honda's 1954 film (appropriately titled *Godzilla*), this monster has wreaked havoc on civilizations throughout the world.[16] As a fictional creature born from the fallout of atomic bomb testing in the Pacific, this giant quasi-dinosaur has gained popularity as both a destructive monster and as a hero, a defender of friends.

Godzilla had the power to reach out and destroy antagonist forces and protect friendly forces from harm. For example, as an antagonist, he was depicted sinking ships, downing aircraft, and even destroying cities; as a hero, he was depicted as defending friends from imminent destruction by other mythical monsters.

The basic premise of the Godzilla Methodology is to use this mythical monster to determine which force on the critical strengths list is required to achieve the objective. Godzilla destroys (removes) one force at a time from the list of critical strengths until removal of a particular force prevents the objective from being achieved. When that happens and the objective can no longer be achieved because of the removal (neutralization or destruction) of a particular force, then that force is the center of gravity. The Godzilla Methodology allows planners to identify which force is the center of gravity by comparing forces identified as critical strengths to the objective.

By definition, the center of gravity is a source of strength whose destruction or neutralization would have a decisive impact on the enemy's or one's own ability to accomplish a given political/military objective.[17] Having determined which force is the center of gravity, planners can continue their analysis to determine how to attack (enemy) or defend (friendly) sources of power.

An Example

To illustrate this methodology, Godzilla will be used to determine centers of gravity for a notional Allied amphibious operation in the Pacific during World War II. Looking first at the enemy objectives, Godzilla will support Japanese forces by destroying Allied critical strengths until one is identified whose removal would prevent the Allies from achieving their operational objective. Having determined the enemy (Allied) center of gravity, the Godzilla Methodology will then be used to determine the friendly (Japanese) center of gravity.

The ultimate strategic objective of the Allied forces in the Pacific during World War II was "the unconditional surrender of Japan."[18] The immediate Allied strategic objective was "to obtain positions from which the ultimate surrender of Japan can be forced by intensive air bombardment, by sea and air blockade, and by invasion if necessary."[19] An Allied generic operational-level objective, nested under these strategic objectives, might have been to seize an island in the Pacific in order to establish an airfield, which would be used to facilitate follow-on operations for the island-hopping concept developed during World War II.

Godzilla will defend the Japanese-held island from attack by Allied forces. If the Japanese had conducted an analysis of force capabilities to determine the Allied operational- level critical strengths, they may have identified the following elements: the submarines assigned to commander, Submarine Forces Pacific; the land-based air in the region; a fast carrier force (consisting of aircraft carriers, fast battleships, cruisers, and destroyers); a fire support group (consisting of battleships, cruisers, and destroyers) used primarily for force protection and gunfire support; and an amphibious attack force (composed of cruisers, destroyers, destroyer escorts, escort carriers, transports, cargo ships, landing craft, mine craft, and supply vessels carrying one or more Army or Marine divisions).

Using Godzilla as a destructive force, the Japanese staff officers could have examined this list of Allied critical strengths by destroying one force at a time, and then analyzing the impact the removal of each force would have had on achieving the objective. For example, if the Japanese used Godzilla to destroy all the Allied submarines operating in the region, would that prevent the Allies from achieving their operational objective of establishing lodgment ashore? The answer is no. Considering all the forces that remain on the critical strength list, the Allies could still conduct an amphibious landing and achieve their objective (seizing the island). Thus, the Allied submarines are not the center of gravity. Continuing with this methodology, if Godzilla destroyed all the land-based aircraft in the operational region, would this prevent the Allies from achieving their operational objective? Once again, the answer is no. The Allies could still use their remaining forces to assault and occupy the island. Thus, land-based aircraft should not be considered the center of gravity. Godzilla could then destroy another force, such as the fast carrier force or the fire support group. Would removal of either of these forces prevent the Allies from achieving their objective? Surprisingly, the answer is still no. In fact, it is not until Godzilla destroys the amphibious attack force that the Allied operational objective is prevented. Thus, the amphibious attack force is the enemy operational center of gravity. It is the only force capable of establishing lodgment ashore.

Determining the center of gravity is only one step in identifying how to attack the enemy. After determining the enemy center of gravity, the Japanese staff officers would still have to continue their analysis to determine how to attack it and the other enemy forces identified in the analysis of critical strength forces. For example, the Japanese staff officers would also need to address how to defeat or neutralize the Allied fast carrier force and fire support group. These forces would have been assigned to support and protect the amphibious attack force so the Japanese would have to deal with each of these forces in some way (deception may be used in addition to annihilation) before commencing an attack on the amphibious attack force.

In this example, the amphibious attack force possesses minimal strength during its transition to the amphibious operating area. It has significant potential strength because of the infantry division onboard, but only minimal offensive strength while in transit. This is the fact that causes staff officers the greatest problem when trying to determine centers of gravity. The fast carrier force and fire support groups obviously possess greater dynamic strength, so why are they not the center of gravity? The answer lies with the objective. If the objective is to seize and occupy an island, then the amphibious attack force is the only force that can achieve that objective. This is the only force listed as a critical strength that has the ability to seize and hold territory. Aircraft, ships, and submarines cannot seize and hold territory; only the amphibious forces of the amphibious attack force can do that.

This methodology can also be used to determine the friendly (Japanese) center of gravity. The Japanese strategic objective in the Pacific during World War II was to win a great engagement

Members of 82nd Airborne board C-17 Globemaster III to conduct static line jump during mobility air forces exercise (U.S. Air Force/Jason Robertson)

at sea (decisive battle) with the Allies to negotiate a settlement.[20] An example of a theater-strategic objective may have been to maintain control over a particular geographic region to keep the Japanese sea lines of communication open, their resources flowing, and their territorial expansion boundaries intact. An operational objective may have been to prevent the Allies from attacking this notional island in the Pacific. If Japanese planners were to compile a list of friendly critical strengths (Japanese forces), it would be similar to the Allies, and might include a naval fire support group (multiple types of warships such as aircraft carriers, battleships, cruisers, and destroyers), submarines, land-based air, and an infantry battalion.

In using the Godzilla Methodology to determine the friendly center of gravity, each element on the critical strength list would be analyzed and removed one item at a time until the objective cannot be achieved. For example, if all the submarines in the area were removed, could the Japanese still prevent the Allies from attacking this notional island? Yes, they have other forces that would allow the Japanese to achieve their objective. It is easy to ascertain that the naval fire support group would be the critical strength necessary for achieving the objective of preventing the Allies from seizing this notional island in the Pacific. This is the only force with enough mobility and strength available to attack the Allied forces en route to the island to prevent the landing. The Japanese naval fire support group is the friendly operational-level center of gravity that should be protected. Protection in this example does not mean this force should be held back and hidden from harm, but rather that it should be used in the attack with the support of other forces on the list of critical strengths. For example, the land-based air could be used to provide protection from aircraft attack and the submarines could be used to provide defense in depth for the Japanese naval fire support group as it attacks the Allied center of gravity.

The Godzilla Methodology provides a simple but effective means of identifying centers of gravity. This mythical film figure can be used by commanders and their staffs during the planning process to determine which forces are necessary to achieve military objectives. Identification of enemy centers of gravity allows commanders to focus their efforts on the neutralization or destruction of those forces that have a decisive impact on accomplishing a given political/military objective. The identification of friendly centers of gravity allows commanders to focus their efforts to protect and possibly enhance the capability of those forces necessary for achieving objectives.

If commanders are having difficulty determining which force is the enemy center of gravity, the Godzilla methodology may provide an answer. Without application of this imaginative methodology, planners may make costly mistakes by focusing their attack on the wrong force. Mistakes of this type can lead to catastrophic consequences. **JFQ**

Notes

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

[2] Ibid., 485.

[3] Ibid., 595.

[4] Joint Publication (JP) 3-0, *Joint Operations* (Washington, DC: The Joint Staff, August 11, 2011), identifies three levels of war to distinguish between national objectives and tactical actions. The strategic level is the highest, referring to the employment of the instruments of national power to achieve theater, national, or multinational objectives. The operational level links the tactical to the strategic, and the tactical is characterized as the employment of forces in relation to each other.

[5] JP 5-0, *Joint Operational Planning* (Washington, DC: The Joint Staff, August 11, 2011), III-22.

[6] Milan Vego, *Joint Operational Warfare: Theory and Practice* (Newport, RI: U.S. Naval War College, 2009), VII-13.

[7] U.S. Naval War College, *Joint Operation Planning Process (JOPP) Workbook* (Newport, RI: U.S. Naval War College, 2012), C-7–C-9.

[8] Ibid., C-7.

[9] Nine principles of war are recognized in joint doctrine: objective, offensive, mass, maneuver, economy of force, unity of command, security, surprise, and simplicity. See JP 3-0.

[10] JP 3-0, A-1–A-5.

[11] Vego, VII-14.

[12] Ibid.

[13] Ibid., VII-16.

[14] Ibid.

[15] Yves J. Bellanger, *U.S. Army Infantry Divisions 1943–45: Volume 1—Organization, Doctrine and Equipment* (Solihull, England: Helion and Company Limited, 2002), 53.

[16] David Kalat, *A Critical History and Filmography of Toho's Godzilla Series*, 2nd ed. (Jefferson, NC: McFarland Company, 2010), 2.

[17] Vego, VII-13.

[18] Commander in Chief, Pacific Ocean Areas, *Campaign Plan Granite* (College Park, MD: Department of the Navy, 1944), 1.

[19] Ibid.

[20] David C. Evans and Mark R. Peattie, *Kaigun: Strategy, Tactics, and Technology in the Imperial Japanese Navy 1887–1941* (Annapolis, MD: Naval Institute Press, 1997), 515.