"Virtual Attrition" and Victory in Maritime Warfare

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The proliferation of "anti-access" threats such as submarines, anti-ship cruise and ballistic missiles, and long-range surveillance systems is today the overriding preoccupation of those who develop maritime strategy, build naval weapons, and organize, train, and equip the fleet. The concepts these communities pursue rely to a great degree on destroying or killing the enemy and its weapons. This decisive and logical approach, however, is not a sustainable one against today's threats and may actually detract from naval forces achieving their objectives. Instead, maritime forces may be better served if they simply avoid threats, impose costs on their adversaries, and accomplish the task at hand.

An enemy force can be taken out of the fight in two main ways. It can be destroyed or killed, which could be called "actual attrition," or it can be marginalized or rendered ineffective, which could be called "virtual attrition." The former requires enemy targets be found and classified precisely, and engaged with a weapon able to locate the target and overcome target countermeasures and maneuvers. This sets a pretty high bar for reconnaissance and command and control capabilities, weapon seekers, and weapon guidance and control systems.

In contrast, virtual attrition may be achievable with a much less expensive and sophisticated set of capabilities. Offensively, it involves friendly forces suppressing enemy operations until the enemy's window of opportunity to conduct them passes. Defensively, virtual attrition can be achieved by compelling the enemy to conduct many more attacks than are necessary because of friendly force disposition, or due to providing the enemy a false of degraded targeting information.

Some historical examples

The Allies success in anti-submarine warfare (ASW) during the Battle of the Atlantic is an excellent example of virtual attrition in action. In the first year of World War II, less than a dozen Axis submarines were on patrol at any given time in the Atlantic Ocean. Despite their small numbers, they imposed hundreds of thousands of tons of shipping losses on the Allies attempting to resupply England. These losses grew only modestly as the number of Axis submarines on patrol grew to more than 100 in 1941, indicating less productivity per submarine. And starting in mid-1942, overall shipping losses per month actually decreased, with a few spikes due to specific operational situations. Submarine losses, however, were less than about 10 per month throughout the battle until late 1944. Something other than submarine losses was causing the U-boat offensive to falter.

That something else was virtual attrition. Allied ASW efforts, while not resulting in many submarine kills, were preventing submarines from getting into position for an effective attack. When they missed their window of opportunity, U-boats were marginalized from the fight until another convoy came along, and the process would repeat. This dynamic took advantage of a submarine's limited speed, self defenses, and sensor capability. Notably, submarines today still have these limitations relative to the surface ships and aircraft arrayed against them.

Another example is in air defense, although ashore rather than at sea. During the Vietnam War, North Vietnamese troops imposed virtual attrition on attacking U.S. aircraft with the introduction of the SA-2 air defense system. This surface-to-air missile system was provided by the Soviet Union and made operational by the time of Operation Rolling Thunder in 1965. Previous to the SA-2's introduction, U.S. strike aircraft only had to worry about anti-aircraft artillery (AAA) (sometimes radar-guided) and MiG interceptor aircraft. Those were negated by flying above the range of AAA guns and bringing fighter escorts to counter the MiGs.

The SA-2 added a new set of threats. It could engage aircraft above the altitude of AAA, taking away the sanctuary American aircraft had enjoyed above 10,000 feet. It was also guided by the ground-based radar all the way to the target, making chaff and flares launched by the target aircraft less effective. Even though the first generation of SA-2's had a less than 10 percent probability of killing an aircraft, U.S. air forces had to respect the threat it posed. As a result, by the end of Operation Rolling Thunder in 1968, half the aircraft in U.S. strike packages were devoted to electronic warfare and defensive counterair missions. Most of these aircraft were converted fighters or fighter-bombers, so the SA-2 was able to essentially reduce the number of strike aircraft in U.S. air forces by one-half.

Implications for future warfare

There are several ways U.S. forces could exploit virtual attrition in future conflicts. For example, the anti-access networks of potential U.S. adversaries such as China or Russia depend on "reconnaissance strike complexes" consisting of surveillance systems and long-range precision guided weapons. Because they depend on "fire and forget" capabilities, these complexes are vulnerable to counter-targeting operations such as electronic warfare, concealment, decoy, and deception. These efforts will compel the enemy to use more weapons than desired as they attack false targets, attempt to overwhelm jammers, and launch multiple weapon at targets with large areas of uncertainty.

Enemy reconnaissance strike complexes are also susceptible to suppression attacks by U.S. and allied forces. Missile launchers, including those on ships and aircraft, make themselves vulnerable to counterattack when they conduct launch operations. Rapid counterbattery attacks by U.S. naval forces could prevent these launchers from preparing for another engagement, even if they do not destroy or damage the launcher. Once discovered, launchers can then be harassed such that they are unable to sustain significant fires.

A particularly naval example of suppression attacks is in ASW. As in World War II, U.S. surface and air forces today could significantly reduce the effectiveness of enemy submarines by using overt ASW sensors, such as low frequency active sonar, and inexpensive standoff weapons such as anti-submarine rockets. Overt sensors will make submarine commanders less willing to approach the

area in which the sensor is operating, out of concern for being detected. And being attacked with a standoff ASW weapon, even if unsuccessful, will cause a submarine to leave the area because is confirms the submarine was detected by ASW forces, and the submarine lacks the speed and self defense capabilities to "stand and fight" as a surface combatant might.

These new concepts could enable naval forces to reduce the ability of the enemy to be effective without actually attriting its forces. Instead, these efforts marginalize the enemy and remove them temporarily from the fight. Other examples will be explored in the presentation as well, but in general this approach offers the potential to improve naval warfighting by focusing capability development on those operations that actually accomplish objectives, rather than simply kill the enemy.