Some Principles of Convoy Operations in Operations Other Than War

A Monograph
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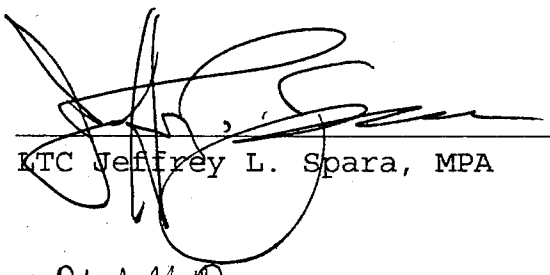

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ABSTRACT

SOME PRINCIPLES OF CONVOY OPERATIONS IN OPERATIONS OTHER THAN WAR by MAJ Brian R. Layer, USA, 50 pages.

This monograph probes a very narrow band of Army doctrine--the wheeled vehicle convoy--by asking if that doctrine is versatile enough for the unique challenges of OOTW. The paper focuses on the more dangerous end of the OOTW spectrum, where convoys operate in peril.

The monograph format is as follows. Section I introduces the monograph and describes the paper's methodology. Section II describes the quiet history of the convoy in conventional, linear warfare. Section III explains why the OOTW environment characterized by the Bosnia and Somalia imbroglios is the most dangerous environment for future American convoys. Section IV explains why a maritime theorist, Sir Julian Corbett, provides insight for operating convoys in OOTW. Section V illustrates why American convoy experience in Vietnam offers a pertinent model for future convoy operations. Section VI checks the versatility of wheeled vehicle convoy doctrine in light of six specific challenges of OOTW.

The paper offers six principles which should undergird a new convoy doctrine. The paper responds to the army's formal doctrinal expansion into OOTW signalled by the 1993 version of FM 100-5 Operations and concludes that convoy doctrine must expand accordingly.

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I. Introduction

> Unlike the Cold War Era - when threats were measurable and, to some degree, predictable - Army forces today are likely to encounter conditions of greater ambiguity and uncertainty. Doctrine must be able to accommodate this wider variety of threats.
>
> FM 100-5 Operations[1]

The Army published a new edition of FM 100-5, Operations, in June of 1993. As the Army's keystone warfighting manual, this document influences all other Army doctrine. FM 100-5 "describes how the Army thinks about the conduct of operations . . . [It] undergirds all of the Army's doctrine, organization, training, material, leader development, and soldier concerns."[2] As such, when it shifts, ancillary Army doctrine must shift accordingly.

This manual outlines the full range of future operations. Because this is the first post-cold war edition, the 1993 release is particularly significant. It describes an increasingly panoramic view of the future which stretches beyond the confines of a narrow, Soviet-focused operational telescope.[3]

FM 100-5 directs considerable attention to Operations Other Than War (OOTW) signalling a significant formal operational expansion.[4] Supporting Army doctrine must adjust accordingly or lose its pertinence. Just as a fish is ill-suited for land,

some here-to-fore appropriate doctrine is ill-suited for the new environment of future Army Operations.

This monograph probes a very narrow band of Army doctrine--the wheeled vehicle convoy--by asking if that doctrine is versatile enough for the unique challenges of OOTW. These vary from non-threatening civil support and disaster relief operations to more dangerous peacekeeping and peace enforcement missions.[5] This paper focuses on the more dangerous end of that spectrum, where convoys operate in peril.

The monograph methodology is simple. Section II describes the quiet history of the convoy in conventional, linear warfare and explains why its lessons could lead Americans into a dark, menacing cul-de-sac in the future. Section III explains why the OOTW environment characterized by the Bosnia and Somalia imbroglios is the most dangerous environment for future American convoys. Section IV explains why maritime theorist, Sir Julian Corbett, whose ideas formed nearly a century ago, provides insight for operating convoys in OOTW. Section V illustrates why American convoy experience in Vietnam provides a practical and pertinent paradigm for future convoy operations and reveals some relevant lessons learned in that conflict. Section VI checks the versatility of wheeled vehicle convoy doctrine by examining how

current doctrine meets six specific challenges of OOTW. It asks whether current doctrine addresses these challenges in a manner consistent with the wisdom of Corbett and the lessons of Vietnam. The final section concludes with the fundamental principles that should undergird a new convoy doctrine.

II. The History of the Convoy in Conventional War

> I see only one thing, namely the enemy's main body. I try to crush it, confident that secondary matters will then settle themselves.
>
> Napoleon Bonaparte[6]

The convoy's role was always what Napoleon refers to as a secondary matter. While tales of supply operations in support of combat pepper warfare's history, they are rarely noteworthy in their own right. While the combined effects of countless convoys fueled armies since antiquity, the singular tactical operation rarely provided strategic effect.

Despite its place in the story of warfare, the convoy's tale is predominantly peaceful. This results directly from the linear nature of war and its underlying theories. Influential nineteenth-century, Prussian theorist, Carl Von Clausewitz, described the convoy attack as a "simple tactical operation" but cautioned it offered only minor benefit.[7] While the attack might disrupt supply operations, the perpetrator's spoils were sparse. Raiders only escaped

with what they could carry because fleeing with bulky wagons slowed the escape and diminished the odds of success.[8] All in all, the attack was a risky endeavor which unjustifiably exposed the marauders to the enemy's principle deterrent--the ability to "rap his knuckles."[9]

Beyond the limited material value of the attack, a second factor discouraged this tactic; the decisive engagement would ultimately take place somewhere else. This factor proved significant. From Britenfeld in 1631 to Waterloo in 1815, decisive battle defined warfare.[10] As historian Russell F. Weigley explains, "the epoch saw the grand-scale battle as the principle instrument of the military strategist, the focus of all his efforts to attain decision in war."[11] Few commanders risked redirecting soldiers to the enemy's rear when the battle lay in balance elsewhere. Hence, convoy attacks occurred infrequently.

Additionally, the linear battlefield's geometry alone enhanced the convoy's shield. Clausewitz explains why.

> Most convoys are better protected by their general strategic situation than is any other part of the army that the enemy may attack, and hence their limited means of defense are decidedly more effective. That is because convoys, as a rule, move in the rear of their own army, or at least at a considerable distance from the enemy's.[12]

The limited range of the horse amplified this effect. Prior to motorization, an army's range from its base was limited. Good horses could only travel fifty to eighty miles, depending upon terrain, and this limited the length of an army's umbilical cord.[13] Because horse limitations kept the convoy tucked closely behind the main body, the army's protective effect increased.

Even as this distance increased with motorization, the widening front on the linear battlefield provided the same relative geometric protection for the convoy. Because of these factors, commanders appropriately diverted little if any force to their protection.

By the 19th century, railroads changed the way armies quenched their growing thirst for supplies. The second half of that century was the great age of railways.[14] While they fueled army drives in both Europe and America, they did not replace the convoy's role. Delivering goods to the front from the army's base--the railhead--remained the convoy's job. In the end, the iron horse scorned the quartermaster's great expectations of simplification; moving supplies from the railhead to the front remained uphill work.[15]

Despite the railroad's powerful capabilities, it limited a commander's flexibility. As early as the First World War, commanders felt immobilized by the

railroad's clumsiness.[16] The motorized vehicle answered their call for a flexible logistics work horse.

Freed from the static support of rail, mobility returned to the battlefield by World War II.[17] While motor vehicles extended the convoy's reach, battlefield geometry still provided an efficient shield.

The acclaimed Red Ball Express demonstrates this power of the motorized convoy. This American transport operation supported the Allied breakout from Normandy. It was, in effect, a continuous convoy operating on a one-way loop reserved for supply operations. Over 130 truck companies provided nearly 6,000 vehicles to the effort.[18] The Red Ball Express, unencumbered by the enemy, rolled from St. Lo to Versailles where it forked north to Hoges's First Army at Soissons and south to Sommesous to Patton's Third.[19] While motorized vehicles extended the convoy's range, the position of Allied forces coupled with air superiority still protected the convoy.

American convoys enjoyed the same protection in Korea. While limited roads, inhibiting terrain, and a vehicle shortage restricted truck operations, convoys still crossed a relatively trouble-free rear area.[20] Again, the traditional battlefield geometry assured convoy protection.[21] Therefore, commanders diverted

little attention or force to convoy protection operations.

These convoy experiences left the American Army unprepared for the Vietnam rear area. Historian Julian Thompson explains the predicament.

> The logistics situation was totally different from that for which the American forces had trained, and had experienced in the Second World War and Korea. There were no clear areas in which logistic installations could be set up, there was no front and rear in the conventional sense.[22]

This result was trouble. Transportation units entered the war with inadequate convoy procedures.[23] As the war progressed, the Army successfully refined its tactics to fit that dangerous environment.

Unfortunately, post-Vietnam operations reinforced the traditional lessons. United States coup de main operations in Grenada, 1983, and Panama, 1989, ended before convoy support operations became necessary in the theater of operations.

In Operation Desert Storm, Allied Forces once again enjoyed the linear battlefield's protection and air superiority. The operation demonstrated the logistic might of American convoy operations. The movement of two corps in the face of the Iraqi Army was an "absolutely gigantic achievement" according to Commander-in-Chief Norman Schwarzcopf.[24] In a two week period, wheeled vehicle convoys moved U.S. VII and

XVIII Corps units up to 500 miles west of their initial defensive positions to set the stage for the attack.[25] This staggering logistical achievement surpassed the storied accomplishments of the Red Ball Express. But once again, commanders turned little attention to protecting convoy operations.

Recent American convoy operations reinforce a historical thread of continuity that convoys operate on American controlled lines of communication (LOC) in a safe rear area. This thread, severed only in Vietnam, helps explains why commanders throughout U.S. Army history devoted little attention and diverted minimal force to the rear with no consequence. A look at the future indicates continuing that practice may soon become a dangerous gamble.

Before the Army rolls into the future and OOTW on the bed of a truck, Army leaders must assess the convoy's protection in OOTW where convoys operate on uncontrolled LOCs.

III. The OOTW Environment

> The Army's participation in OOTW is not new. They have protected citizens at the edge of the frontiers of an expanding America; built roads, bridges, and canals; assisted nations abroad; and served our nation in a variety of other missions.
>
> FM 100-5 Operations[24]

While the Army's participation in OOTW is not new, the level of violence associated with some of these

missions exceeds those of the past. In fact, the OOTW--peacekeeping and humanitarian assistance--environment characterized by the Bosnia and Somalia imbroglios is the most dangerous environment for future American convoys.

In these operations, the convoy operates outside the protective shield of the army main body. In fact, most of these operations lack a main body mission all together. Consequently, this operational environment differs dramatically from actual war.

That convoys may face greater dangers in OOTW is a strange paradox. These operations can constitute the worst case for convoys because they operate outside the protective shield of the army. Even in the most benign operations like disaster relief, threats exist. Because convoys haul valuable supplies, profit-seeking actors will always envy that cargo. However, as the level of anarchy rises and the propensity toward violent means increases, the convoy's path becomes increasingly perilous. In situations where successful U.S. Army convoy operations threaten the interests of hostile actors who operate beyond the reach of U.S. combat forces hamstrung by the OOTW rules of engagement, the convoy faces its stiffist challenge. A doctrine versatile enough for these challenges should fill wartime mandates as well.

Several tactical factors differentiate the OOTW convoy environment from wartime conditions. The nature of OOTW missions differs dramatically from war. For example, in Bosnia over twenty-thousand United Nations troops contribute to peacekeeping and humanitarian operations.[27] There, the UN mandate includes delivering relief supplies. In these operations, logistics units conduct the primary mission.

In war, convoys perform a supporting role. They assist combat forces in the fight--where decisive outcomes are forged. In OOTW however, failed convoys carry strategic implications. For example, in February 1993, continued convoy failure triggered the American decision to airdrop relief supplies into Bosnia.[28] On 3 October 1993, a U.S. Army convoy was ambushed on the streets of Mogadishu, Somalia. The incident contributed to a failed raid which forced a United States policy decision to exit Somalia.[29]

Because convoys traditionally traversed roads protected by the army to the front, they enjoyed freedom of operation on roads under army control. This freedom rarely exists in OOTW where LOCs are uncontrolled. In this environment, convoys habitually share roads with other traffic--neutral and hostile alike. These vehicles and their inhabitants pose new threats and unique challenges to convoy planners.

In Somalia, U.S. convoys faced a terrible dilemma while en route to deliver urgent food and medical aid. Along the roads, desperate Somalis stopped vehicles short of their destination and begged for the driver's aid.[30] Convoys also confronted more lethal hazards on the roads there; U.N. convoys faced a constant threat of snipers and mines.[31]

In Bosnia, on another continent, similar threats emerged. Angry citizens blocked relief convoys for weeks during the brutal winter of 1993 in hopes of prolonging their enemy's suffering.[32] Later that year, a sniper attack killed a U.N. driver and halted convoys in much of central Bosnia.[33]

The convoy's very nature changes in OOTW. In wartime, convoys form to travel routes connecting friendly units. At the end of the route, someone else ensures the convoy's security. In OOTW, however, the convoy's mandate extends beyond the route itself and includes security and distribution operations at the destination.

Destination operations comprise one of the convoy's greatest challenges. A relief calamity in Srebrenica illustrates the problem. In April 1993, a convoy traveled to the starving city to evacuate refugees. The convoy entered the city and met only chaos and disorder. No one of authority had preceded

the convoy to arrange the evacuation. A desperate rush for space on the trucks ensued. Sadly, several people were crushed by the panicky swarm and two children died from their wounds.[34]

Convoys in OOTW forfeit the traditional notion of operational security. The success of many OOTW tasks depends upon civilian knowledge of convoy activities. Refugee evacuation and humanitarian aid missions illustrate this need. In both situations, neutral parties must know the time and place these missions transpire because success depends on a convoy meeting people in need.

Convoy activities become public knowledge as soon as trucks leave their base. Even when supporting U.S. military activities, uncontrolled lines of communication betray their movements. In other words, the enemy is always watching!

In this environment, the enemy enjoys an asymmetrical advantage. They can attack at the time and place they choose and then vanish instantly into the local population.[35] This makes convoy protection in OOTW particularly problematic. These tactical factors all add risk to convoys in the OOTW environment.

The OOTW environment is more dangerous than traditional rear areas. Therefore, commanders must

support convoy operations. The absence of traditional linear geometry places the convoy in jeopardy. Ignoring convoy security requirements can lead to failure in this fluid environment.

It appears that the bulk of American wartime experience provides poor precedent for convoys in OOTW. Additionally, the antique theories of Clausewitz and Jomini, a traditional source of answers, describe events on a linear battlefield. These lessons seem inappropriate as well. Still, some theoretical structure should undergird a convoy doctrine. A viable theory will assist the convoy in its essential OOTW task--delivering goods on uncontrolled LOCs.

Despite the apparent deficit of army experience in this environment, predecessors have charted these waters. Maritime nations have faced a similar environment at sea for centuries. They have learned how to survive on naval lines of communication which are shared by friends as well as enemies. It seems that a viable maritime theory might eliminate some ambiguity in the most dangerous end of the OOTW spectrum as well. For that reason Julian Corbett's maritime theory commands attention.

IV. Julian Corbett's Maritime Theory

Corbett provides an important theoretical foundation for developing a doctrine that protects

convoys from the threats found in OOTW. Corbett explains why theory is the correct starting point.

> . . .in the study of war we must get our theory clear before we can venture in search of practical conclusions. So great is the complexity of war that without such a guide we are sure to go astray amidst the bewildering multiplicity of tracks and obstacles that meet us at every step.
>
> Sir Julian Corbett[36]

Sir Julian Corbett was Britain's greatest naval theorist. Trained as a lawyer, he became a civil servant and influential military historian.[37] Despite a non-martial upbringing, his maritime theory influenced warfare in his age and far beyond.

His most enduring work is Some Principles of Maritime Strategy.[38] His concise, graceful prose is based on a series of lectures he presented to students at the British Naval War College, Greenwich, in the first decade of the Twentieth Century.[39] He provided a certain voice in an uncertain age. His masterful work, penned between Trufalger and Jutland, challenged conventional naval theory. The splendid days of sail were gone forever and his words offered a welcome beacon in the early, stormy days of steam.

He offered a fresh view that challenged the sea power experts of his day. His focus on commerce protection and maritime power was a direct shot across the bow of conventional naval thought.

He recognized that most naval theorists derived their ideas from land theory. Convinced that land theory prompted an unnecessary naval fixation with seeking and destroying the enemy's fleet, he attacked the assumption that the two were similar forms of war.[40]

He built his argument with three general principles. First, on land the enemy's main force is the primary object.[41] Ashore it is always possible to strike the enemy's army. At sea, however, "the enemy can remove his fleet from the board."[42]

Second, terrain dominates war ashore more than at sea.

> In land warfare we can determine with some precision the limits and direction of our enemy's possible movements. We know that they must be determined mainly by roads and obstacles.[43]

At sea, the enemy can strike and escape in any direction.

The final distinction is the navy's purpose. On land, defeating the enemy's army is the army's primary duty. At sea, a navy's primary duty is commerce protection.[44]

> The object of naval warfare is in the control of communications, and not, as in land warfare, the conquest of territory.[45]

These three principles form a solid bulwark dividing war on land from war at sea. These

distinctions do not hold in OOTW. Given the differences, some OOTW environments appear more analogous with the naval environment Corbett describes. For the same reasons land theory did not correctly describe Corbett's sea, it does not always apply to OOTW.

In OOTW, the principle object is not always the enemy main force. Here, like at sea, the enemy may avoid major battle preferring to chip away at an army's extremities. He can "remove himself from the board" by blending into the local population and area.

Second, while roads and obstacles still define the movements of gathered armies, they limit less a fluid enemy. A potential enemy in OOTW is less reliant on distinct LOCs.

Finally, the distinction between the aims of armies in OOTW and navies at sea is similar as well. In OOTW missions like humanitarian assistance, an army's success often depends upon protecting and distributing relief supplies rather than destroying an enemy army.

Ironically, Corbett's convincing argument for breaking naval warfare from the binds of land theory, provides equally convincing evidence that his theory should undergird convoy doctrine for OOTW. Today his

beacon provides direction to the soldier as well as the sailor. Corbett contends that,

> The most common situation in naval warfare is that neither side has command; that the normal position is not a commanded sea, but an uncommanded sea.[46]

While traditional war convoys enjoy what is essentially "command" of the LOCs, this is not true in OOTW.[47] He explains that the problem of exercising control is that one cannot own the sea. "You cannot exclude neutrals from it as you can from territory you conquer."[48] It is just this environment--uncontrolled LOCs--that the modern convoy faces. Corbett's prescription for gaining temporary, local control on a shared sea is a vital and practical goal in fluid operations on land.

The first step toward gaining control is an assessment of the enemy's will. As Corbett explains,

> Even when the object is clear it will be necessary to know how much value the enemy attaches to it. Is it one for which he will be likely to fight to the death, or one which he will abandon in the face of comparatively slight resistance?[49]

If the enemy is willing to die, Corbett contends, "you have to overpower his powers of resistance."[50] If not, he adds, "something less costly and hazardous and better within our means," will suffice.[51] In the former case, a convoy cannot operate securely until the enemy's means are abated. In the latter, the convoy can flourish if planned and executed correctly.

After assessing the enemy, the business of commerce delivery--the convoy--begins. While the convoy is an offensive act, its protection requires a defensive posture. Corbett contends, "all war and every form of it must be both offensive and defensive."[52] This is an important nuance. While the commander defends the convoy, success rests in quickly identifying threats and countering the perpetrators. For Corbett, the essence of defense is:

> . . . the counter-attack--waiting deliberately for a chance to strike--not cowering in inactivity. Defense is a condition of restrained activity--not a mere condition of rest.[53]

Corbett's principle for the counter-attack is concentration. While the naval critics of his day favored keeping the fleet in mass, Corbett deferred. He argues that maintaining enough firepower to concentrate on the enemy when attacked is sufficient. He argues, only a superior enemy will mass and attack the fleet. An inferior enemy will avoid battle and attack commerce. Therefore, Corbett contends that commerce protection is a more appropriate role for the fleet.[54]

This concept also applies to the convoy in OOTW. While integrating protective combat force in every column is impractical in war, the opportunity exists in OOTW.

Local, temporary control is possible in OOTW. Corbett describes local control as, "the state of things in which we are able to prevent the enemy from interfering with our passage or communication . . . during the period required."[55] This state--local, temporary control--is a realistic aim for successful convoy operations in OOTW. Providing the means to gain and maintain this state in a fluid, ocean-like environment is an appropriate mandate for a contemporary OOTW convoy doctrine.

Corbett prescribes three methods of obtaining this condition: first, find and contain the enemy; second, deceive the enemy; and third, mask your own force.[56] The first two options call for destruction of the enemy fleet. While this is an appropriate wartime aim, it is incompatible with OOTW. The third option--mask your force--does apply to these operations. While rules of engagement may rule out the more aggressive actions, the essence of the masking option--self-defense--is a principle of all army operations.[57] This option is appropriate in OOTW and calls for clarification.

Corbett depicts the masking option as: "Superior concentration so as to render impotent the enemy's force available. . ."[58] This proposition holds the battle fleet, traditionally reserved to seek and destroy the enemy, in a communications protection

role.[59] The idea applied to la would use combat forces (the army equivalent of a battle fleet) in a communications protection role. While impractical in most war operations, this is the appropriate convoy procedure for OOTW. A convoy doctrine applicable to that environment must include methods for planning and organizing the integration of combat forces into convoys in this manner.

Sir Julian Corbett's theoretical direction provides solid intellectual guidance. But theory fills in only half of the doctrine puzzle. A responsible doctrine balances the theoretical canon with practical experience.

As previously addressed, only a few pertinent historical convoy lessons apply. War rarely produced an environment with uncontrolled LOCs. One notable exception exists--Vietnam. American convoys operated in this environment and learned many noteworthy lessons.

V. Vietnam Convoy Lessons

The linear geometry of conventional war never formed in Vietnam.[60] The rear area, traditionally a safe haven, was an important object of the enemy.[61] Consequently, convoys embarked on a dangerous journey every time they left the security of their base.

That war differed dramatically from the anticipated war with the Soviets. When it ended, most lessons learned held dubious future value. Despite this, convoy procedures refined there, hold enormous value today.

Vietnam shared many environmental characteristics with OOTW. For convoy operations, in particular, striking similarities exist. Most importantly for this study, U.S. convoys shared uncontrolled LOCs with other traffic including a cunning, fluid enemy.

In Vietnam, convoys operated in constant peril in an insecure rear area. There ambush and the threat of ambush produced a pronounced military effect.[62] U.S. commanders diverted large numbers of troops and vehicles from combat operations to security and escort duty in response to the prevalent threat.[63] Still, despite these efforts, most convoys operated alone. "The compelling need to move cargo dictated the do-it-yourself principle."[64]

Vietnam coincided with previous wars in one convoy aspect--the wheeled vehicle convoy delivered the bulk of logistic support to combat forces.[65] The duration and magnitude of convoy operations on uncontrolled LOCs make the war a fertile source of lessons.

Enemy attack tactics included mines, snipers and ambushes. Each tactic preyed on the wheeled vehicle

convoy's peculiar vulnerabilities. First, because designers of military supply trucks trade protection for hauling capacity, the vehicle's thin skin was a lucrative target.[66] Second, because convoys traveled through uncontrolled territory, the enemy could strike almost anywhere. Unless convoys constantly prepared for attack, they were always vulnerable.

Enemy attacks did not last long. Most casualties occurred within the first minute of the engagement.[67] This is when the enemy's greatest advantage--surprise--was most effective. American commanders learned that reducing and perhaps reversing the enemy's advantage was quite possible.[68] The first requisite for reversing the enemy's advantage involved reducing vehicle vulnerability. Commanders accomplished this by hardening their vehicles with a combination of sand bags and armor-plating. This effectively protected against both mines and small arms fire.[69]

Adding automatic weapons to the column also enhanced defense. Gun trucks and escorts afforded the convoy commander a necessary means for responding to attacks. The effect proved more than punitive, however; a single visible gun truck alone deterred enemy attacks. The integration of combat vehicles in the column amplified this effect.[70]

Beyond vehicle protection and weapon availability, two other convoy practices improved effectiveness in Vietnam. Using a friendly translator in the lead of the column diffused problems with non-combatants and also gained useful intelligence about enemy activities in the area.[71] Additionally, the Volunteer Informant Program proved invaluable. This country-wide program encouraged Vietnamese civilians to volunteer useful information for monetary reward. When money was available, it gave the convoy commander a useful bargaining chip on the road as well.[72] In Vietnam, commanders who authorized and encouraged interaction and negotiations with local citizens enjoyed convoy success.[73]

Many effective convoy procedures which worked in Vietnam were peculiar to that war. For instance, engineers cleared up to one-hundred meters of foliage along the sides of frequently traveled roads.[74] While this technique improved security, it does not translate well to OOTW where concerns about collateral damage discourage these activities.

Still many practical lessons learned in Vietnam apply to future dangerous OOTW. In particular, lessons about protecting vehicles and drivers, countering ambushes, and managing civilian interference translate easily to future operations. These same lessons

learned by experience transformed an Army with inadequate convoy procedures into one that could successfully negotiate the challenges of that ambiguous environment. The practical and theoretical lessons combine to form an appropriate standard for a future OOTW convoy doctrine. Unfortunately, current doctrine falls short of this standard.

VI. Convoy Doctrine

FM 55-30 Motor Transport Units and Operations devotes two chapters to convoy operations.[75] The first, Chapter Five, discusses convoy planning, organization, and control. The second, Chapter Six, discusses convoy defense procedures. Both chapters are written like a "how-to manual;" they bolster doctrinal guidance with tactics, techniques and procedures. The versatility of this doctrine is examined in light of the unique OOTW threats.

Six threats--three lethal and three non-lethal--represent a range of challenges for convoys in OOTW. Mines, snipers, and ambushes represent the lethal threats; while the interference of neutrals, road blocks, and destination operations represent non-lethal threats in this environment.

An appropriate Corbett principle, substantiated by Vietnam experience, is cited that should underscore convoy doctrine for each threat. If the doctrine

reflects that principle, it adequately prepares the convoy for the OOTW threat. If not, FM 55-30 requires expansion. While only a limited number of threats, the range of challenges is sufficient to test the doctrine's versatility.

Lethal Threats

Ambush

Corbett provides sound guidance for confronting the first lethal threat. He asserts the convoy must stay aggressive. It cannot cower in inactivity because any advantage the defense maintains depends upon preserving the offensive spirit. "Its essence is the counter-attack--waiting deliberately for a chance to strike."[76]

Vietnam experience reaffirms the value of this axiom in ambush operations. The enemy ambush rarely lasted longer than twenty to thirty minutes.[77] Viet Cong doctrine emphasized the importance of speed to develop surprise and to "limit the effectiveness of modern enemy weapons and enemy power."[78] Successful counterambush reactions were quick and powerful. When effective, they exacted such a toll on the enemy which discouraged further ambushes.[79]

The mere presence of a combat unit in the area produced little deterrent effect. The enemy calculated the American response time and withdrew before they

arrived.[80] However, the presence of combat forces in the column did deter enemy action.[81]

In addition, air support played an emerging role in convoy defense. There, the threatening presence of a single helicopter improved security.[82] The enemy feared the aircraft's capabilities and made its availability an important intelligence requirement.[83] Helicopters not only provided needed fire support, they provided a substantial ambush deterrent as well.[84]

Combat arms and aviation escorts added offensive capability to the convoy. This capability intimidated the enemy and helped convoys survive the dangerous roads of Vietnam.

Vietnam experience clearly supports Corbett's theoretical axiom about maintaining the offensive spirit. A versatile convoy doctrine must reflect these lessons because the ambush is a common OOTW threat.

FM 55-30 addresses the ambush. While its emphasis is clearly defensive, it does describe counter-attack procedures in detail.[85] The doctrine details appropriate actions for escorted convoys as well as those operating alone. It recommends commanders integrate combat arms escorts, air support and a detailed fire plan into each convoy plan, but acknowledges conflicting priorities could preclude this support.

The doctrine reinforces the importance of training for this task. "The effectiveness of counterambush techniques is directly related to the state of training of troops and the leadership ability of the leaders."[86] The influence of Vietnam experience is evident and the doctrine appropriately incorporates those lessons.[87]

FM 55-30's counter-ambush direction heeds the theory of Corbett and the lessons of Vietnam. This portion of the doctrine demonstrates the versatility necessary for facing the ambush challenge of OOTW.

Snipers and Mines

Snipers and mines offer two additional OOTW threats. Surprise is an important ingredient of both attacks. As a consequence, defense against these hinges on adequate protection.

Julian Corbett offers insight on this issue. He warns that even when battleships provide cover, complete security of the fleet is impossible. As a consequence, other ships are armed and hardened for protection. He explains that if navies could afford this theoretical inertia, every class of ship would evolve into a battleship.[88]

American convoy experience in Vietnam reinforces his axiom. Because combat forces and engineers could not escort every dangerous mission in Vietnam, logistic

forces improvised. For added protection and a limited offensive punch, transportation units hardened vehicles and developed standard gun trucks. These efforts, though less effective than escorts, saved many convoys from the deadly effects of mines and sniper fire.[89] Still, these efforts exacted a heavy toll on productivity--hardened trucks carried less cargo.[90]

Unit discipline played a vital role in Vietnam convoy defense. Tracking the wheel print of lead vehicles helped drivers avoid mines. When they hit them, correct vehicle hardening saved lives as well as cargo. Units that observed proper helmet and flack vest discipline enhanced the vehicle's protection against snipers and mines.[91]

Engineers also performed a critical convoy protection role. They cleared mines, paved dangerous dirt roads and cleared foliage along the side of the road. With this support, convoy success increased.[92]

FM 55-30 properly addresses protection. It heeds the lessons of Vietnam as well as Corbett's warning. The doctrine outlines several specific protection procedures refined in Vietnam. Most importantly, it directs tracking the lead vehicle, uniform discipline (helmets and flack vests) and vehicle hardening in hostile areas.[93] FM 55-30 provides appropriate

guidance for conducting convoys on uncontrolled OOTW LOCs where mines and snipers are prevalent.

Non-Lethal Threats

Non-lethal threats are a unique feature of OOTW. The very nature of these missions forces soldier interaction with civilians. Convoys not only share roads with civilians but deliver supplies directly to people in need as well.

This OOTW subtlety is explored by addressing the three non-lethal threats. They are neutral interference, road blocks, and destination operations.

Neutral Interference and Roadblocks

The problem of neutral interference is not an OOTW anomaly. Refugees and indigenous populations influence wartime operations as well. In OOTW, encounters with civilians are unavoidable. Many missions require convoy passage through heavily populated areas.

Here again, Corbett helps by illuminating the environment. In traditional linear warfare, the opponent's LOCs run in opposite directions originating at opposite polls and meeting at the place of battle."[94] At sea, the antithetical occurs; the LOCs "run parallel, if, indeed, they are not identical."[95] In this environment, unimpeded communications are impossible unless you destroy the fleet that shares those lines."[96]

In OOTW, the local population constitutes one of the other "fleets" found on convoy LOCs. While destroying this neutral fleet is unacceptable, controlling it is not. Therefore, convoy planners must expect and plan for civilian interference.

Again, practical experience proves the veracity of Corbett's theory. In Vietnam, civilian traffic commonly interfered with convoy operations.[97] Although, convoy policies directed commanders to post guards when the column stopped, convoys rarely controlled the crowds.[98]

Two policies helped diffuse civilian interference. First, convoys placed interpreters in the lead vehicle of the column. The interpreters not only eased communication between civilians and the soldiers, they also gathered vital information about enemy activities from their discussions with local inhabitants.[99] Second, the aforementioned Volunteer Informant Program (VIP) provided Americans an important bargaining chip with civilians. The program gave convoy commanders a useful negotiation tool on the roads of Vietnam.[100] Despite their success, the utility of similar programs is not reflected in current doctrine.

FM 55-30 treats civilian interference as an avoidable problem. The doctrine recommends avoiding halts where, "there is a lot of local traffic or people

walking," and prohibits stops in towns and cities.[101] But this sound guidance is difficult to follow in an OOTW mission that includes convoy deliveries directly to populated areas in order to relieve civilian suffering. In addition, FM 55-30 neglects the lessons learned in Vietnam about communicating with and controlling local civilians. As a consequence, the doctrine leaves the convoy unprepared for two OOTW non-lethal threats--neutral interference and road blocks.

Destination Operations

Destination operations also test the versatility of OOTW convoys. Unlike war where trucks meet other military units at their destination, OOTW does not promise this luxury. Particularly in humanitarian operations, convoy deliveries promise a unique challenge.

Julian Corbett's theory again sheds light on this environmental problem as well. Corbett offers the colorful adage, "where the carcase [sic.] is, there will the eagles be attracted," to underscore the danger at terminals of destination and departure.[102] He contends these locations present the most lucrative targets and the greatest security risk.[103]

Even in the Vietnam War where the roads were insecure, the destination location offered a safe haven.[104] This environment reinforced the traditional

view that convoy planning included the entire route but ended at the perimeter of the secure destination location. As a consequence, Americans lack experience with this OOTW challenge. Unfortunately, FM 55-30 provides no doctrinal assistance; it ignores destination security as well.

The doctrine neglects destination operations completely. Convoys will plan and execute destination operations in OOTW. A versatile doctrine must address the convoy's role in both logistic and security operations at the destination terminal.

FM 55-30 reflects its stated purpose, "to provide support to fighting elements engaged in winning the land battle."[105] The document properly prepares convoys for operations in war. The thorough attention devoted to lethal threats demonstrates this strength. However, the manual does not devote the same attention to non-lethal threats. This lack of versatility weakens the document. The success of future OOTW convoys rests on the adequate revision of this document. Because FM 100-5 directs preparation for war as well as operations other than war, the army must develop a convoy doctrine versatile enough for this full dimension of operations.

The performance of convoys in U.S. Army history reflects solid doctrinal principles. The doctrine

writer stares at the daunting task of answering the challenges of the future while at the same time preserving the capability of replicating great past logistical achievements.

VII. Conclusions

Although the convoy confronts a range of lethal and non-lethal threats on uncontrolled LOCs in OOTW, a strong doctrine can prepare convoys for the dangers of this environment. Current wheeled convoy doctrine, as outlined in FM 55-30, falls short of this summons. While it appropriately addresses the lethal threats OOTW shares with war, it ignores the non-lethal threats unique to that environment.

This new environment does not warrant a separate convoy doctrine. FM 55-30 is the fitting document for both war as well as OOTW, but the current doctrine's narrow wartime focus is a liability. The convoy doctrine must reflect the versatility of FM 100-5--the Army's keystone document. The following principles should undergird convoy doctrine.

Wartime Support

Convoy doctrine must maintain a wartime focus. Despite OOTW missions, the army exists to fight and win the nation's wars and convoys exist to support that effort. Army convoy doctrine must retain the ability

to repeat past wartime logistical accomplishments like those of the Second World War and Desert Storm.

Operations Other than War Support

While the doctrine's focus is war, OOTW missions will continue. A versatile convoy doctrine can address both environments. An expanded version of FM 55-30 is the correct vehicle to define and address both the lethal and non-lethal threats of OOTW. In future army operations, convoys will travel uncontrolled LOCs; FM 55-30 must chart a safe course for that journey.

Offensive Spirit

The current version of FM 55-30 addresses the counter-ambush procedures. Future editions of this manual should copy this emphasis. Corbett warned that retention of the offensive spirit is the key to counter-attack operations. American experience in Vietnam supports this principle. Convoy doctrine must reflect this spirit.

In order to reflect the offensive spirit, FM 55-30 must continue doing three things. First, it must define how to integrate combat arms escorts and fire support into convoys when they are available. Second, it must discuss how transportation convoys can defend themselves when this support is unavailable. Finally, it must define how to respond to the ambush when it develops.

The ability to strike back when attacked is an essential component of convoy security in war as well as the more dangerous missions of operations other than war. This capability increases convoy protection and deters ambush activities as well. Because many future OOTW convoys will include enhanced escorts and firepower, a new doctrine must outline adequate procedeures for employing these tools.

Protection

Current convoy doctrine addresses protection adequately. This principle will remain a vital component of convoy defense. Future convoys will travel on uncontrolled LOCs. Consequently, snipers and mines may pose a constant threat. Because both tactics rely on surprise, sound vehicle and driver protection are important issues. Therefore, convoy doctrine must define effective protection measures. Both Corbett's theory and the Vietnam experience reinforce the value of protective measures. That the current FM 55-30 reflects these lessons is a strength of the document. Future editions must retain this emphasis.

Neutral Interference

Neutral interference is an evolving problem in convoy operations. Recent U.N. operations in Bosnia and Somalia underscore the requirement for doctrinal direction for this non-lethal threat.

Vietnam provided some lessons about this problem. There convoys armed with language capability and negotiation tools enjoyed success with civilians. Future convoys will turn to doctrinal guidance for aid and FM 55-30 must provide substantive guidance.

Destination Operations

In OOTW convoys face a new challenge. Many missions will support civilians directly. This hinders operational security because neutral parties must know when and where the convoy will arrive in order to coordinate distribution and evacuation efforts. Additionally, the convoy's responsibility, traditionally bound to the road, extends to the destination terminal where these efforts transpire.

Convoy doctrine must address security and distribution at the convoy's destination. The doctrine will remain incomplete until it addresses this non-lethal threat. It must offer appropriate procedures for successful and secure destination operations.

These six principles should undergird a future convoy doctrine: wartime support, OOTW support, offensive spirit, protection, neutral interference and destination operations. If they do, the doctrine will adequately address the environment which could prove

the most dangerous for future convoys--hostile operations other than war.

The 1993 version of FM 100-5 includes OOTW in the range of army operations. The OOTW spectrum includes dangerous missions which offer unusual threats to wheeled vehicle convoys. These threats result from a unique fixture of this environment--uncontrolled LOCs. While American convoy experience in this environment is limited, a maritime theorist, Sir Julian Corbett, provides a clear description of the environment and its threats. His theory, bolstered by American convoy experience on the uncontrolled LOCs of Vietnam, provides a solid foundation for developing a convoy doctrine for the OOTW environment. Current doctrine fails against this standard. While appropriate for the lethal threats of OOTW, the doctrine lacks the versatility to guide convoys through full dimensional operations. An expansion of the current FM 55-30 in accordance with the wisdom of Corbett and the lessons of Vietnam is needed. Such an expansion will protect the convoy from the peril that looms in future operations other than war.

ENDNOTES

1. U.S. Army, Field Manual 100-5, Operations, (Washington D.C., June 1993), 1-1.

2. Ibid., 1-1-1-2.

3. Ibid., 2-0 - 2-1. FM 100-5 describes the wide range of Army operations. They extend from large scale war to nation assistance.

4. FM 100-5 devotes an entire chapter (13) to OOTW., 13-0 - 13-8.

5. FM 100-5, 2-1. This manual defines the range of OOTW. From pacific moving toward war, they include, nation assistance, peace building, civil support, disaster relief, counterdrug, NEO, peacekeeping, antiterrorism, support to insurgency, peace enforcement, strikes, and raids.

6. David Chandler, The Campaigns of Napoleon (New York: MacMillan, 1966), 141.

7. Carl Von Clausewitz devotes chapter eighteenth of his seventh book to "Attack on Convoys." He denounces the value of these operations in, On War, ed. and trans. Michael Howard and Peter Paret, (Princeton, NJ: Princeton University Press, 1989), 556.

8. Ibid., 555. Clausewitz notes the best attackers can hope for is, "cutting the traces, taking out the horses, blowing up the ammunition carts, and so on. This will halt the convoy and throw it into confusion, but it will not actually be lost."

9. Ibid., 556.

10. Russell F. Weigley, explains the significance of the grand-scale battle during this period in, The Age of Battles, (Bloomington, IN, 1991), He provides a concise introduction to the concept on page xi10.

11. Ibid., xi.

12. Clausewitz, 555.

13. Martin Van Creveld, Supplying War, (London: Cambridge University Press, 1977), 27.

14. Van Creveld, explains the influence of rail on military logistics in, Supplying War, 81.

15. Van Creveld, recounts the difficulties armies endured supplying combat operations from a railhead in the rear area. While few armies struggled loading railcars, distribution to the front was an overwhelming task for most. He describes their ordeal in detail in Supplying War, 81 and 131-134.

16. Van Creveld, 81-83. See also James A. Hutson. He provides a wonderful account of American experience in The Sinews of War, (Washington: Center of Military History, 1988), 198-214.

17. Van Creveld, agrees with Liddell Hart's conclusion that Napoleon-like maneuver is impossible during the First World War, returned to the battlefield a generation later on the wheels of the motor transport in Supplying War, 140.

18. Hutson, The Sinews of War, 526-527. The Red Ball Express peaked 29 August 1944. That day, 132 truck companies with 5,958 vehicles hauled 12,342 tons of supplies.

19. James C. Shepard, provides a concise description of this leviathan operation in, "The Red Ball Express," Transportation Corps (July 1992): 40-41. For a detailed account of facts and statistics associated with the logistics operations see Hutson, Sinews, 526-528.

20. David C. Rutenberg explains the specifics of truck operations in support of American Forces in Korea in, The Logistics of Waging War (Gunter Air Force Station, AL: Air Force Logistics Management Center, 1983), 135-136.

21. Julian Thompson explains the linear nature of Korea operations in a comparison with support operations in Vietnam in, The Lifeblood of War (London: Brassey's, 1991), 192.

22. Ibid., 193.

23. Lieutenant General Joseph M. Heiser, Jr., explains that the American Army used inadequate convoy procedures when the war began. He describes the initial problems and efforts to overcome them in Vietnam Studies: Logistic Support (Washington: Department of the Army, 1971) 35-36. LTG Heiser also

recounts the story of Sergeant William W.Seay. Seay, a truck driver, won the medal of honor for efforts defending his convoy from ambush in August, 1968., vi.

24. Gus Pagonis quotes Norman Schwarzkopf in, Moving Mountains (Boston: Harvard Business School Press, 1992), x.

25. Pagonis describes the move, Moving Mountains, 145-146.

26. FM 100-5 (1993), 13-0.

27. "Air Drop on Bosnia," describes the UN mission in the former Yugoslavia. The article appears in Economist 36 (27 February 1993): 16.

28. "America Drops In," Economist 326 (27 February 1993): 51. This article cites ground convoy failure forced President Clinton's decision to airdrop relief supplies over Bosnia.

29. Sean D. Naylor and Steve Vogel offer a detailed report of the Ranger mission in Somalia which promted an American decision to exit that country. In that story, they describe the events of an ambushed convoy and its role in the mission failure. The recount this story in "A Smooth Starting Raid Ends in Catastrophe," Army Times 12 (18 October 1993): 4, 26.

30. As the commander of the initial logistics forces delivering relief supplies in Somalia, Col Harper held a keen perspective. He tells that story in, Gilbert S. Harper, "Operations Other Than War: Leading Soldiers in Operation Restore Hope," Military Review LXIII - 9 (September 1993): 77-79.

31. Naylor, "A Smooth-starting Raid Ends in Catastrophe," 26. Naylor recounts the frustration of 10th Mountain Division soldiers who ran safe roads early in the operation and later faced a constant threat of land mines and sniper fire.

32. The continued failure of ground relief operations which set conditions for an American airlift are described in, "America Drops In," 51.

33. "Shooting Underscores the Danger to Convoys in Bosnia," Star, Kansas City, 18 November 1993: A-8, a-f.

34. Michael Montgomery, "Flight of Terror," Time 141 (12 April 1993): 38-39.

35. Brian Jenkins, Rand Corporation, discusses the difficulty of maintaining security in Peacekeeping missions. His assessment of the Marine barracks bombing is quoted in, "Is There a Lesson in Beirut Security?," Air Force Times (7 November 1983): 33.

36. Sir Julian Corbett, Some Principles of Maritime Strategy, ed. Eric J. Grove (Annapolis: Naval Institute Press, 1988), 15.

37. Herbert Rosinski devotes a sizable portion of his book to Corbett's theory. In addition, he provides some biographical data in the introduction., The Development of Naval Thought, (Newport, RI, 1978), XVI. For additional information, see Eric J. Grove's introduction to Corbett, Some Principles of Maritime Strategy, vi-xlv.

38. Corbett was a prolific author. His major works are discussed in Eric J. Grove's introduction to Some Principles. There Grove explains this book's impact and lasting value in detail. Julian S. Corbett, Some Principles of Maritime Strategy, xiv-xlv.

39. Herbert Rosinski, explains the books's source in his introduction to The Development of Naval Thought, xvii. Grove provides a synopsis of Corbett's association with and impact on the British War College in his introduction to Some Principles.

40. Julian Corbett attacks conventional wisdom in his discussion about the object of naval war in, Some Principles of Maritime Theory, 91-106.

41. Julian Corbett devotes detailed attention to the difference between land and sea warfare. The first distinction is explained in Some Principles of Maritime Strategy, 155-156.

42. Ibid., 156.

43. Ibid., 158.

44. Ibid., 160. Julian Corbett explains that chasing the enemy's main force at sea puts commerce in jeopardy.

45. Corbett, 94.

46. Ibid., 91.

47. Corbett describes "command of the sea" as, "when the enemy is no longer able to act dangerously against our line of passage and communication or to use or defend his own, or (in other words) when he is no longer able to interfere seriously with our trade or our military or diplomatic operations." Corbett, 338.

48. Ibid., 93.

49. Ibid., 17.

50. Ibid., 17.

51. Ibid.

52. Ibid., 36.

53. Ibid.

54. Ibid., 128-132. Corbett explains his principle of concentration. This ran against the predominant theorists of his day who favored a priciple of mass like land theorists.

55. Ibid, 337.

56. Ibid., 321.

57. FM 100-5, underscores that all ROE must include the soldier's right to self defense., 2-4.

58. Corbett, 321.

59. Ibid., 114.Corbett, explains that protecting cruisers and flotilla is an important role of the battle fleet.

60. The unique nature of Vietnam War rear area operations is explained by Julian Thompson, The Lifeblood of War, (London: Brassey's, 1991), 192.

61. Mark J. Eisner, Robert B. Ryan and John R. Shirley, Counterambush Techniques to Protect Military Vehicular Traffic on Major Highways in South Vietnam (Washington: Research Analysis Corporation, 1963), 9-10. The authors describe why the VC/NVA made the rear area an important focus of their strategy.

62. Joseph Heiser, Jr., discusses the logistics effects of convoy ambushes Vietnam Studies: Logistic Support, (Washington: Department of the Army, 1971), 162.

63. The cost of protecting convoys in terms of combat power is explained by Mark J. Eisner, Robert B. Ryan and John R. Shirley, Counterambush Techniques to Protect Military Vehicular Traffic on Major Highways in Vietnam (Washington: Research Analysis Corporation, 1963), 1.

64. Joseph Heiser, Vietnam Studies: Logistic Support (Washington: Department of the Army, 1974), 36.

65. Vehicle Convoy Operations in the Republic of Vietnam (Vietnam: U.S. Army Concept Team in Vietnam, 1972), II-8.

66. Heiser, explains the protection-capacity trade-off in, Vietnam Studies: Logistics Support, 162.

67. Eisner, 16. Eisner describes VC/NVA ambush techniques. He reports most damage is inflicted in the "first few seconds" of the ambush before the convoy reacts to the fire.

68. Eisner, Counterambush Techniques, 3.

69. Heiser, Vietnam Studies: Logistic Support, 36.

70. The deterrent effect of visible weapons is explained in Vehicle Convoy Operations, II-23.

71. Ibid., II-83

72. Vehicle Convoy Operations, provides a detailed description of the Volunteer Informant Program on, II-82.

73. Ibid., II-82. This work explains that VIP was particularly successful identifying the location of mines along convoy routes.

74. Ibid., II-80 - II-82.

75. U.S. Army, FM 55-30, Motor Transport Units and Operations, (Washington: Department of the Army, 1984), Chapters 5 and 6. The U.S. Army Transportation School has proponency for this manual. They are currently revising the manual.

76. Corbett, 36.

77. Vehicle Convoy Operations, II-40 - II-41. This study provides a detailed description of enemy ambush tactics, techniques and procedures. From initial

action to withdrawal, the enemy rarely needed more than "20-30 minutes." The length of ambush was closely tied to the response time of local American combat forces.

78. Eisner, Counterambush Techniques, 16.

79. Vehicle Convoy Operations, II-40. This study explains that successful counterambush actions protected the convoy as it passed through the "kill zone" and inflicted a toll on the enemy. These actions created a deterrent effect. VC/NVA ambushers avoided convoys which presented a counterambush threat.

80. Ibid., II-40. The VC/NVA gathered intelligence about local American activities prior to the ambush. They planned their action accordingly, insuring U.S. combat forces could not interfere with their ambush.

81. Vehicle Convoy Operations, II-41.

82. Eisner, Counterambush Techniques, 34. The helicopter provided both a psychological threat in being. While gun ships were preferred, the enemy feared the observation helicopter's fire support. The observer could both call for and observe fires.

83. Ibid., II-40 - II-42. This study portrays the intimidating effect of helicopter gun ships. The study includes enemy POW attitudes toward air support.

84. Vehicle Convoy Operations, II-43. This study reports that every transportation unit queried (35 total) reported the deterrent effect of helicopter support to convoy operations.

85. FM 55-30, 6-1 - 6-11. These convoy defense procedures emphasize operational security and protection first acknowledging that the convoy's primary role is transporting personnel and equipment. The doctrine emphasizes passive protection measures always and combat escorts when they are available.

86. Ibid., 6-9.

87. FM 55-30, R-1. The manual devotes an appendix to ambush instructions developed through Vietnam experience.

88. Corbett, 119-120. He explains why the protection and firepower of all ships tends to the absolute.

89. Heiser describes the evolution of hardened vehicles and gun trucks in, Vietnam Studies: Logistics Support, 161-162.

90. Thompson explains the support-defense trade-off in The Lifeblood of War, 199-200. Additionally, LTG Heiser tells that the 8th Transportation Group lost the equivalent of one truck company's lift when they hardened their trucks in, Logistic Support, 162.

91. Vehicle Convoy Operations, II-56 - II-77.

92. A detailed description of mine detection and road clearing techniques and results in Vietnam is presented in, Vehicle Convoy Operations, II-76 - II-84.

93. FM 55-30, 6-8 - 6-10. The doctrine provides detailed procedures against sniper and mine threats. It acknowledges that unit discipline is a prerequisite for surviving these attacks.

94. Corbett, 322. Corbett describes that traditional land lines of communication run toward one another. Clausewitz, On War, 345., explains the same relationship. He contends that these lines serve two purposes; first, they provide lines of communication when moving toward the enemy and second, they provide lines of retreat when necessary.

95. Ibid., 322-323. Corbett refers to this relationship as "the peculiarity of maritime communications" and contends it is the controlling influence of maritime warfare. This fundamental premise that separates Corbett's theory from most others.

96. Ibid., 322-324.

97. Vehicle Convoy Operations, II-45. Civilians interfered with many convoys. Local traffic, pedestrians, and construction projects were particularly disruptive.

98. Ibid., II-49, explains the difficult task of controlling civilians when convoy is stopped in populated areas.

99. Ibid., II-82, discusses the tasks assigned to interpreters in convoy operations.

100. Ibid., I-82. VIP was a country-wide Military Assistance Command, Vietnam program. They outline its objectives and value in convoy operations.

101. FM 55-30, 5-12.

102. Corbett, 261. Corbett uses this phrase to emphasize the danger of terminal operations.

103. Ibid., 261. Corbett refers to harbors as fertile for two reasons. First, the enemy knows the ships must stop there for supplies. Second, that is where trade converges.

104. John H. Hay, Vietnam Studies: Tactical and Material Innovations (Washington: Department of the Army, 1974), 148-153. LTG Hay describes the contrast between the security of base camps and the danger of roads connecting them.

105. FM 55-30, 1-1.

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