THE FIELD ARTILLERY IN COMBINED ARMS MANEUVER AND WIDE AREA SECURITY OPERATIONS

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The recent publication of the Army Operating Concept 2016-2028 (AOC) and the Future Concept for Fires (FCF) conceptualizes doctrine for the Fires War Fighting Function (WFF). These documents introduced the concepts of Combined Arms Maneuver (CAM) and Wide Area Security (WAS) as the U.S. Army's core competencies and delineated requirements for the Fires WFF in these operations. A review of these documents reveals the Fires WFF must inculcate the lessons learned from conducting various operations over the last ten years while regaining an expertise in delivering massed fires in support of CAM operations.

This thesis explored the question: can the Field Artillery adapt to the AOC and remain relevant? To accomplish this, the thesis examined the current organization, training, and material and determined the current capabilities of the Fires WFF. Next, this thesis scrutinized the AOC, the FCF, and the potential future operational environment and determined capabilities the Fires WFF must possess in the future. Then this thesis compared the current capabilities of the Fires WFF and the future capabilities and determined that the Fires WFF can adapt its organization, training, and materiel, maintain relevant WAS operations skills while regaining an expertise in delivering fires in support of CAM.

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

THE FIELD ARTILLERY IN COMBINED ARMS MANEUVER AND WIDE AREA SECURITY OPERATIONS, by MAJ Kirk J. Junker, U.S. Army, 65 pages.

The recent publication of the Army Operating Concept 2016-2028 (AOC) and the Future Concept for Fires (FCF) conceptualizes doctrine for the Fires War Fighting Function (WFF). These documents introduced the concepts of Combined Arms Maneuver (CAM) and Wide Area Security (WAS) as the U.S. Army's core competencies and delineated requirements for the Fires WFF in these operations. A review of these documents reveals the Fires WFF must inculcate the lessons learned from conducting various operations over the last ten years while regaining an expertise in delivering massed fires in support of CAM operations.

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Thank you all for your support. I can only hope that the results of this effort are worth half as much as the investment all of you made in me.

TABLE OF CONTENTS

ACRONYMS

AFATDS	Automated Field Artillery Tactical Fire Direction System
ALB	Air Land Battle Doctrine
ALB-F	Air Land Battle Future
ALO	Air Land Operations Doctrine
AO	Area of Operations
AOC	Army Operating Concept
ARFORGEN	Army Force Generation
ATACMS	Army Tactical Missile System
CAM	Combined Arms Maneuver
DIVARTY	Division Artillery
DOD	Department of Defense
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities
EBO	Effects Based Operations
FA	Field Artillery
FCF	Functional Concept for Fires
FDC	Fire Direction Center
FIST	Fire Support Team
FSO	Full Spectrum Operations
GMLRS	Guided Multiple Launch Rocket System
HIC	High Intensity Conflict
IADS	Integrated Air Defense System
IDF	Israeli Defense Force

IED	Improvised Explosive Device
JCIDS	Joint Capabilities Integration and Development System
LIC	Low Intensity Conflict
MCO	Major Combat Operations
MLRS	Multiple Launch Rocket System
NATO	North Atlantic Treaty Organization
Net Warfare	Network Centric Warfare
NLOS-C	Non-line-of-sight Cannon
NLSO-LS	Non-line-of-sight Launch System
ODS	Operation Desert Storm
PGM	Precision Guided Munition
SADARM	Sense and Destroy Armor
TACFIRE	Tactical Fire Direction
TRADOC	Training and Doctrine Command
U.S.	United States
UAS	Unmanned Ariel Vehicle
USAF	United States Air Force
WAS	Wide Area Security
WFF	War Fighting Function

ILLUSTRATIONS

Page

CHAPTER 1

INTRODUCTION

> Notably, it means that when we are committed to any mission along the spectrum of conflict, we must be prepared for all forms of contact. That is, we must be prepared for full spectrum operations. This requires an unprecedented degree of versatility among our leaders.
>
> — General Martin E. Dempsey,
> 2008 Speech at the AUSA Chapter Presidents Dinner

On August 12, 2006, 24 Merkava IV's, the Israeli Defense Force's (IDF) premier main battle tank, from the Tank Brigade 401 initiated movement in the Wadi Saluki. The tanks were ordered to drive towards the Litani River in southern Lebanon. Although supported by infantry, the mighty Merkava IVs found themselves in a blocked ambush shortly after crossing the line of departure. The tank crews fought valiantly and the Merkava tanks performed extremely well. At the end of the day anti-tank missiles hit 11 of the 24 tanks and killed eight crewmembers. The Israelis were lucky. Was it not for the exceptional protection afforded by the Merkava IV, the Israelis may have suffered many more killed.[1]

While the Merkava IV may have proven its ability to protect a tank crew, the IDF demonstrated an alarming inability to conduct combined arms operations. Brigade 401 essentially fought alone even though there were other units in the area. The division used air assault infantry to secure the high ground around the *wadi* to support the brigade's attack. However, the infantry simply occupied a few houses in villages near the high ground and reported the area secure. Unfortunately, Brigade 401 was not able to coordinate with the supporting infantry. The lack of coordination with the supporting infantry contributed to the brigade's confusion in the *wadi* and rendered the brigade

unable to use indirect fires due to a fear of fratricide. Although equipped with the ability to produce their own smoke screens, the tanks of Brigade 401 did not utilize any obscuration, even after the ambush started!

Prior to the 2006 Hezbollah-Israeli War, the IDF had fought years of counterinsurgency operations in the Palestinian West Bank. There the IDF had an absolute advantage in firepower and protection over their adversary. Proficiency at the company and platoon level was key in the IDFs fight in the West Bank. Few commanders at the brigade and battalion level had any appreciation for combining the effects of indirect fires with coordinated operations between armor and infantry forces. In other words they did not have much experience fighting using their combined arms to overwhelm the enemy with firepower.[2] This experience in the West Bank and a lack of combined arms training and experience left the IDF woefully ill-prepared for the Hezbollah-Israeli War.

Background Information

Likely taking lessons from the Hezbollah-Israeli War, the United States (U.S.) Army recognized the importance of maintaining an ability to operate using a combined arms force structure. In August of 2010, The U.S. Army Training and Doctrine Command published *The Army Operating Concept (AOC) for 2016 to 2028*. This new operating concept lays out how the Army will fight in the coming years and describes the future operational environment it will operate in. The new doctrine describes the concepts of Combined Arms Maneuver (CAM) and Wide Area Security (WAS) and how they fit into Full Spectrum Operations (FSO). An Army warfighter today would recognize CAM as Major Combat Operations (MCO) at the high end of the spectrum of conflict. An

example of CAM is the initial attack from Kuwait to Baghdad. Similarly, today's warfighter would recognize WAS as the counterinsurgency the Army fought following the fall of Baghdad. Key to the new AOC is the requirement for Army units to transition quickly between ends of the spectrum.[3]

Prior to the AOC, Field Artillery (FA) doctrine was developed under the Network Centric Warfare (Net Warfare) concept or sometimes referred to as information dominance. The concept of information dominance emphasized effects, technology, information sharing, and precision strike capabilities. The organization of FA battalions changed in Net Warfare. This concept reduced the number of headquarters and howitzers in each battalion. The reduction in headquarters and howitzers left these battalions seemingly less capable since there was not a commensurate increase in the capacity for the howitzers to deliver fires. However, these battalions would mitigate these reductions by their information dominance, through the procurement of improved howitzers and the use of precision guided munitions (PGMs). These formations, it was intended, made up for their lack of mass by having a superior knowledge of the enemy thus providing the ability to avoid enemy formations and targeting them from a distance.[4]

The FA developed several systems to adapt to Net Warfare or information dominance approach to war fighting. Fort Sill, the home of the U.S. Army FA, embarked upon an ambitious development program. Fort Sill poured vast amounts of money into PGMs like Guided Multiple Launch Rocket System (GMLRS) and the Excalibur family of munitions. Also, in order to support the maneuver forces with massed artillery from smaller units, Fort Sill began development of the Non-Line of Site Cannon (NLOS-C) and the Non-Line of Site Launch System (NLOS-LS).[5] The success of FA development,

in retrospect, ranged from excellence to failure. Fort Sill's development of the precision guided munitions to support Net Warfare proved extremely useful in WAS operations in both Iraq and Afghanistan. However, the Department of Defense (DOD) stopped development of the NLOS-C and the NLSO-LS. When DOD canceled the new weapon systems, it left the FA with materiel designed to fight MCO in the Cold War and an organization designed to fight Net Warfare.

In practice, the Net Warfare designed and MCO equipped forces have performed quite well in WAS operations in Iraq and Afghanistan. However, these operations exposed gaps in FA organization, training, and materiel. In WAS operations FA units conducted missions not typically assigned to FA formations. These in-lieu-of missions included securing logistics convoys, maneuver missions, and base defense operations. Other units are used in a traditional firing role. But instead of massed battalion fires, commanders completely reorganized their battalions to support distributed FA operations. Battalions conducting distributed FA missions, broke their platoons into smaller elements, and spread these elements across the entire area of operations.

In WAS operations, the FA faced a difficult challenge with respect to training and material. To accomplish these in-lieu-of missions FA units required a significant amount of time retraining for their various missions. Some FA organizations went years without firing any artillery rounds and atrophied in their core competencies. Units that performed in-lieu-of mission also required a significant amount of theater provided equipment (TPE) because their artillery specific equipment was not suitable to conduct basic patrols. Units that conducted distributed FA missions found it difficult to maintain crews for their

guns and fire direction centers (FDC) for the required 24 hours per day, seven days per week they were needed.

As the wars in Afghanistan and Iraq proceeded the FA force became more experienced with their in-lieu-of mission than their core competency of delivering fires. FA battalion, batteries, and platoon all performed their mission with aplomb. In the end, however, these conflicts have left the FA very experienced in WAS operations but still doctrinally equipped and organized for CAM.

Problem Statement and Thesis

With the new AOC, times have changed again for the FA. The AOC specifically requires the FA to conduct both fires and non-fires tasks, thus potentially cementing the in-lieu-of missions into the core competencies of the FA.[6] This thesis explores the question: can the Field Artillery adapt its organization, training, and materiel to the new U.S. Army Operating Concept and remain relevant? After exploring the current state of the FA with respect to doctrine, training, and materiel this paper will examine what missions the FA performed historically in hybrid threat environments. Then using the AOC, this paper will identify the potential gaps in the organization, training, and material of the FA to answer the central question. Provided with this information this paper will examine ways that the FA can, with reasonable changes to its organization, training, and materiel, maintain relevant WAS operations skills while regaining its expertise in delivering fires in support of CAM.

Limitations and Delimitations

Limitations

Since the U.S. Army recently published the AOC it is likely the U.S. Army and the FA are examining the same questions this thesis proposes. Shortly after completion of this work or even prior to its completion, the U.S. Army or the FA will release changes to doctrine or force structure. It is impossible for the author of this thesis to know what exactly problems and solutions the U.S. Army and the FA may examine or propose as a result of the publication of the AOC.

Delimitations

In addition to not knowing which of the AOC's problems the Army will attempt to resolve, the author of this work further delimited it by only examining the aspects of doctrine, and offering examination and recommendations in the domains of organization, training, and materiel. While there are more areas to examine, this work will not explore the domains of leadership, personnel, and facilities. This thesis may address aspects of leadership under training, but ultimately the leadership solutions to these problems are as diverse and complex as the individual that would implement the recommendations. In other words, each leader would most effectively find solutions to the changes imposed by the AOC in their own way. Finding personnel solutions is also difficult to include in this document due to the complex nature of U.S. Army manning and Congressional limits on the number of personnel in the U.S. Army. Any proposed solution requiring additional personnel would require either a Congressional Act to increase U.S. Army end strength or a commensurate decrease in manning elsewhere in the U.S. Army. Finally, this thesis

assumes there are few if any solutions to doctrinal problems found in the realm of adding or improving existing facilities.

In addition to delimitations in the realm of leadership, personnel, and facilities, this thesis will contain only unclassified information. While there is for official use only material relating to this topic, this thesis will avoid this material in an effort to make this thesis as widely distributable as possible.

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[1]Matt M. Matthews, *We Were Caught Unprepared: The 2006 Hezbollah-Israeli War* (Combat Studies Institute, U.S. Army Combined Arms Center, Fort Leavenworth, KS: U.S. Army Combined Arms Center Combat Studies Institute Press, 2008), 55.

[2]Ibid., 63.

[3]Department of the Army, TRADOC Pamphlet (Pam) 525-3-1, *The United States Army Operating Concept 2016-2028* (Washington, DC: Government Printing Office, August 2010), 13-14.

[4]Thomas K. Adams, *The Army After Next: The First Postindustrial Armynext: The First Postindustrial Army* (Westport, CT: Greenwood Publishing, 2006), 35.

[5]Martin D. Mapels, "Relevant and Ready, The FA Now and the in the Future," *Field Artillery Magazine* (November/December 2003): 4.

[6]Department of the Army, TRADOC Pam 525-3-1, 52.

CHAPTER 2

LITERATURE REVIEW

> The mission of the Field Artillery is to destroy, neutralize, or suppress the enemy with cannon, rocket, or missile fires and to integrate all fire support assets into the combined arms operations.
>
> — Department of the Army,
> *Field Artillery Manual Cannon Gunnery*

Many artillery officers remember the daily requirement to cite the mission of the FA while attending the Field Artillery Officer Basic Course at Fort Sill, Oklahoma. Since then, the mission of the FA has changed. The mission now describes, "integrating lethal and non-lethal fires to enable maneuver."[1] The mission may evolve again to nest with the AOC. The research for this paper will determine if the FA can change with respect to organization, training, and material to meet the requirements in the TRADOC published AOC. To gain an appreciation of the situation and effectively answer the question, this paper first explores FA doctrine, organization, training, and material acquisitions following the Vietnam War, since most of the systems in use today were developed in that period. Then this paper will explore the changes in FA organization, training, and material up to the latest Army transformation. The second part of the literature review chapter will explain the nature of, and challenges associated with, the hybrid threats the US Army faces. Finally, this chapter reviews the AOC and the Field Artillery Fires Functional Concept to determine the specific tasks the FA must accomplish in the future. With this information the reader should understand the current capabilities of the FA, the threat the FA could face in the future, and what the U.S. Army requires of the FA in the future.

Active Defense and Air Land Battle

In the late 1970s when the US Army developed Air Land Battle doctrine, the threat from the Warsaw Pact forces of Eastern Europe was foremost in the minds of both Army and the North Atlantic Treaty Organization (NATO) planners. The Warsaw Pact was made up of primarily the Soviet Union, East Germany, Czechoslovakia, and Poland. Together, the Warsaw Pact held an advantage over the NATO forces in the areas of armor, mechanized infantry, and especially artillery.[2]

According to TRADOC historian Boyd Dastrup's *The King of Battle, a Branch History of the U.S. Field Artillery* and *The Army After Next: the First Postindustrial Army* by national security consultant Thomas K. Adams, the Army first adopted Active Defense and later Air Land Battle doctrine to counter this significant threat. These doctrines were heavily influenced by the lessons learned from the IDF experience in the 1972 Yom Kippur War. During the Yom Kippur war, the IDF faced "an enemy superior in numbers, attacking by surprise, equipped by the Soviet Union, and employing Soviet tactics."[3] In the Sinai Peninsula, prior to the Yom Kippur war, the IDF relied heavily on their armored counter attack forces supported by their Air Force. When the Egyptian Army successfully conducted a crossing of the Suez Canal they experienced early success by overwhelming the IDF with ground forces protected by an integrated air defense system (IADS) purchased from the Soviet Union and a large amount of artillery.[4] This situation was eerily similar to what NATO planners expected in Europe.

Like in the Sinai Peninsula, the NATO planners expected the Warsaw Pact to support their attack with superior numbers of artillery and an IADS. However, in the plan to defend Europe, NATO planners believed that their tactical-level defense could

withstand only the first echelon of an attacking Warsaw Pact force. Therefore, it was critical, as Dastrup noted, for the FA to "disrupt or delay the second echelon before it could join the first to overwhelm the defense."[5] In other words, the U.S. Army and NATO knew it could not defend Western Europe against wave after wave of Warsaw Pact armored forces. Therefore, the FA's mission was to support the infantry and armor forces (collectively referred to as maneuver forces) and disrupt or delay follow on attacks.

To accomplish the mission of disrupting or delaying the Warsaw Pact's second echelon forces, the FA community identified four primary problems facing U.S. Army artillery. First, the numerical superiority of the Warsaw Pact presented a very lethal and powerful first strike threat coupled with a very capable counterfire threat. Second, the FA needed to increase the speed of planning and processing missions. Third, the FA needed to vastly increase the range and lethality of their systems to target the Warsaw Pact's second echelon forces. Finally, the FA needed to better integrate their fires with the maneuver forces they supported. According to Dastrup, Fort Sill addressed these challenges through ambitious changes to doctrine, organization, training, and material.[6]

According to Dastrup, the FA addressed the problem of surviving a powerful Warsaw Pact's first strike and very capable counterfire capabilities by changing the battalion organization and upgrading the current self-propelled howitzers. The U.S. Army increased the size of FA battalions from three batteries of six guns to three batteries of eight guns each (3-by-8).[7] However, simply having more guns was not enough, so to survive a Warsaw Pact first strike and avoid counter fire, the FA needed a mobile, protected gun that could fire, displace quickly, emplace, and fire again. This need for

survivability and mobility on the battlefield resulted in the development of the M109A6 self-propelled howitzer, which would possess the capability to self locate and calculate its own fire missions.

The increased survivability of the howitzers was not enough to address all of the issues with the FA. To manage the very mobile and large battalions, Fort Still invested heavily in computer technology that not only aided in command and control but also would help solve the second issue of decreasing the planning and processing time for fire mission. Fort Sill's first developed Tactical Fire Direction System (TACFIRE), which was the first battlefield network of computer that would pass target and fire mission data digitally from location to location. This system also was able to compute firing data and request assistance from other units if targets were too far away.[8] While the system significantly improved the mission processing speed it was limited in its ability to stretch the distance between the guns and the FDC. The system originally relied upon a wire connection between the gun and the FDC but was eventually upgraded to a line-of-sight digital radio signal.[9]

To effectively place fires onto Warsaw Pact second echelon forces, the FA needed a way to deliver lethal conventional (non-nuclear) rounds at vastly increased ranges over their current systems. Fort Sill, according to Dastrup, adopted a two-pronged approach to the problem. First, Fort Sill developed cannon tubes with increased ranges. Fort Sill increased the range of its 155mm artillery from 18KM to 30KM and developed the Multiple Launch Rocket System (MLRS) with a range of 30 KM. Second, Fort Sill set out requirements for precision-guided munitions; specifically the laser guided 155mm

Copperhead and the 155mm Sense and Destroy Armor (SADARM) rounds.[10] Together, these systems could range and place effective fires upon the second echelon forces.

However, ranging the enemy was only one part of the equation. To target the enemy and integrate these fires with maneuver forces, according to *The King of Battle*, the FA developed the Fire Support Team (FIST) concept. The FA realized that to increase the effectiveness of its fires, it needed to integrate observers with the infantry and armor (maneuver) formations. Previously, artillery observers were attached to maneuver formations along with observers for the 60mm company mortars and the 4.2-inch battalion mortars. When these systems were used at the platoon and company level, there was little, if any, coordination between the observers to maximize the effects of their fires. To remedy this, the FA developed the FIST concept.[11] This concept eliminated the mortar observers and gave the FIST responsibility to integrate and control all fires, with guidance from the company commander. Conflict occurred during the development of the concept. The Army wanted to assign the FIST to the maneuver companies while the FA wanted to keep the FIST assigned to the FA battalions, attaching them when needed. The maneuver community argued that assigning the FIST to their companies would improve the knowledge of integrating fires since they had the responsibility to train the observers. However, the FA argued that not having the FIST connected to the FA battalion would result in degraded observer skills and decrease the ability of the FA to integrate with maneuver because the observers were not accountable to the FA battalion.[12] In the end, the FA prevailed and the FIST was assigned to the FA battalion and attached to the maneuver units for missions.

In summary, to prepare for the fight in Europe, the FA began development of many of the systems and organizations still used today. The M109A6 Paladin, TACFIRE, AFATDS, MLRS, and the FIST were all developed based on the threat from the Warsaw Pact.

Air Land Operations

The Army perfected Air Land Battle throughout the 1980s but, fortunately, did not have to use it since the Warsaw Pact collapsed in the late 1980s and the threat to Europe was defeated without firing a shot. The Army did put its doctrine to use in the deserts of the Middle East in Operation Desert Storm (ODS). Since the enemy for which ALB doctrine was developed had fallen apart in Europe, following ODS the Army was confronted with two major challenges. First, with the fall of the Warsaw Pact and the end to the Cold War came the end of large budgets to support the expansive military built to defeat it.[13] Second, while the Army was very successful in Desert Storm, the war did highlight several challenges the Army would have to address to remain relevant in the future. In an effort to redefine itself after the Cold War, the Army developed what was first referred to as Air Land Battle-Future (ALB-F), which evolved to Air Land Operations (ALO).

The U.S. Army developed ALO in a fiscally constrained environment. To overcome the challenge of maintaining the semblance of a similar capability with fewer forces, Thompson concluded the Army adjusted its previous doctrine to include more joint efforts with the other services but kept the Army in the lead as the decisive branch of service.[14] Consequently, the Army could accomplish its missions with fewer forces and with as much of its budget as possible.

Another way ALO doctrine attempted to accomplish more with less was to use technology to target the enemy more precisely with fewer forces. The FA, after years of development, added the M109A6 Howitzer (Paladin) to its inventory. Since the Paladin was more survivable and could fire quicker than its predecessor, the Army reduced the number of guns from 24 to 18 in a battalion to form a 3-by-6 organization. However, in a review of Air Land Operations doctrine in a low-intensity conflict or WAS environment, School of Advanced Military Studies student Major Robert Swan, concluded the FA would not be able to support a heavy brigade combat team effectively with only 18 guns. Swan concluded that in a WAS environment, having enough systems to cover the entire area of operations was more important than the ability to avoid counterfire.[15]

Effects Based Operations and Modularity

Another lesson learned from ODS was the effectiveness of PGMs. The United States Air Force (USAF) had primarily used unguided bombs but they effectively used large number of laser-guided bombs as well. Following the success attributed to the laser -guided bomb, USAF leaders and proponents began pushing Effects Based Operations (EBO) as a cost-effective solution to warfare. EBO proposed a cheaper, faster way to win wars through very precise targeting of key targets that maximized effects on the enemy.[16] EBO focused on controlling the enemy through effects achieved from precise targeting rather than objectives that physically put the enemy in a position of disadvantage. In his paper titled Effects Based Doctrine, then director of the Air Force Quadrennial Defense Review Lieutenant General David Deptula asserted that precision targeting by stealth aircraft accounted for 2 percent of the sorties but encompassed 48 percent of the targets hit in Operation Desert Strom.[17] Following this logic, Deptula surmised that with

precision guided bombs and stealth aircraft; the military could accomplish more with a smaller force. He further pointed out the USAF would reduce the need for cargo aircraft since it required more transportation assets to move one light infantry division than all of the PGMs used throughout ODS.[18] Since land forces were very expensive to maintain, this was an effective argument during the economic austerity of the 1990s.

According to Deptula, EBO was a revolution in military affairs not unlike the scientific revolution that occurred when Copernicus discovered that the sun, instead of the Earth, was the center of the universe.[19] In other words, proponents of the land component as the decisive arm were as backward thinking as those who once believed the Earth was the center of the universe.

Another advantage provided by EBO, according to Deptula, was the speed at which friendly forces could assert control over the enemy. He proposed that land component objectives placed the enemy at a disadvantage or resulted in their destruction were no longer necessary. All that was necessary, according to Deptula, was the targeting of the key component of the enemy's organization that would result in the desired effect of rendering the enemy force ineffective, such as targeting the command and control nodes.[20] This idea suggested it was no longer necessary to take the time to move a large land force into a theater in order to defeat the enemy. In Deptula's argument, the USAF could exert their will upon the enemy by appropriately employing PGMs.

EBO made inroads into U.S. Army doctrine and to the FA as it prepared for the most recent round of transformation.[21] In the budget-constrained environment following ODS, the military as a whole was downsizing. Fort Sill was very interested in finding ways to maintain the same capabilities with fewer soldiers and less equipment. EBO fit

nicely into this scheme. The FA already had a PGM in the Copperhead and SADARM was still under development. Furthermore, the FA expanded the role of the MLRS by developing Guided MLRS rockets and the Army Tactical Missile System (ATACMS). The PGMs, it was believed, would allow for smaller FA battalions that no longer needed high volumes of fire to suppress the enemy. A smaller FA battalion firing PGMs could simply, like Deptula suggested, hit a few decisive targets to inflict paralysis upon the enemy.[22]

EBO not only affected the FA community; it also heavily influenced the most recent round of U.S. Army transformation. Recently, the U.S. Army converted to a modular concept using smaller BCTs, which relied upon information dominance, superior communications, and the careful application of firepower to defeat the enemy.[23] These BCTs were smaller with only two maneuver battalions and a reconnaissance surveillance target acquisition squadron. In modularity, the U.S. Army also reduced the FA battalion from a 3-by-6 configuration to a 2-by-8[24] configuration for both light and self-propelled FA battalions. This configuration reduced the number of cannons in each battalion by two. Additionally, the self-propelled battalions reduced by one third the fire direction centers (the element inside of the battery that controls the guns) and the ability for these battalions to conduct simultaneous missions.[25]

While the U.S. Army transformed to modularity and incorporated EBO, both ideas had critics. According to Milan Vego, a Professor of Operations in the Joint Military Operations Department at the Naval War College, EBO ignored the classic idea of Clausewitzian fog.[26] Or in other words, Vego did not believe commanders could use technology to overcome the confusion that typically accompanies war. Former Army War

College Student and artilleryman COL Noel T. Nicolle addressed the topic in his paper, Effects of Transformation and the Artillery Branch. He posited that the EBO-inspired transformation was originally intended to "to make the Army more agile through Modularity" but instead "seriously degraded the primary organic fire support in Army combat organizations."[27] Nicolle also noted that while modularity increased the number of BCTs, it actually reduced by 30 percent the number of infantry and armor battalions in the U.S. Army.[28]

In addition to those criticizing the use of EBO in shaping doctrine and BCT size, there were also critics of the focus on PGMs in future fires. Interestingly, in the age where PGMs were seen as the dominant munition on the battlefield, the U.S. Army canceled SADARM in 2003because it lacked precision and deemed the venerable Copperhead round obsolete. However, the FA continued to use the ATACMS and the GMLRS, and then fielded the GPS guided 155mm Excalibur round. The FA used these munitions in both Afghanistan and Iraq. But the use of unguided, suppressive fires still had a place in the artillery. According to COL Mark A. Waters, U.S. Army, unguided, suppressive fires are still useful on the modern battlefield due to their increased responsiveness and the inability of the observer to precisely locate the enemy on the battlefield.[29]

> While artillery delivered precision munitions convincingly demonstrated their lethal capability during OIF with the 3d Infantry Division's use of SADARM, it was close support artillery, 105mm M119s, 155mm Paladins and Multiple Launch Rocket Systems (MLRS), employed in their traditional role of delivering massed area suppressive fires, which provided the most responsive and destructive fires of the campaign.[30]

COL Waters' research is significant because it empirically repudiated the philosophy behind EBO and modularity, since the smaller FA battalion in the modular force has fewer guns to use in suppressive fire.

In summary, EBO was focused on using information dominance or superior information about the enemy and friendly forces to enable the precision targeting of enemy centers of gravity. EBO was not focused on the destruction of the enemy force or upon objectives. Also, EBO and modularity allowed, in theory, for a smaller BCT that made up for its lack of firepower through improved situational awareness, superior communications, and PGMs. Critics of EBO suggested that it was essentially based on a false premise and that objectives and unguided munitions still had value in land warfare.

Current FA Training Challenges

For the last ten years, the United States has committed the U.S Army to conflicts in both Iraq and Afghanistan. In these operations, the FA has performed missions across the spectrum of conflict. While some FA organizations delivered fires in a traditional sense, others performed in-lieu-of missions ranging from base defense operations to truck convoy escort to infantry-type missions. In almost all cases, these units were required to either significantly adjust their organization to meet mission requirements or train on a new skill set unrelated to FA. This section will examine the missions performed by these organizations and the impacts these missions had on FA organizations.

Each year the *Fires Journal* publishes an overview of what Fires battalions accomplished over the last year. Called the Red Book, this edition receives submissions from units across the force. Since there is no requirement from the journal itself for units to submit articles, many do not. Consequently, the Red Book is not a definitive

summation of what the entire Fires force did over the last year, although it does show trends. In the 2009 and 2010 editions of the Red Book only seven battalions each year reported conducting a pure fires mission.[31] Specifically In the 2010 edition several other battalions reported providing hot guns to support their brigades in addition to other in-lieu-of missions. Battalions conducting pure fires missions did so in a non-standard fashion by distributing platoons across a large area of operations.

Most battalions did not perform a fires mission at all. These battalions performed in-lieu-of missions such as maneuver mission, detainee operations, and security force assistance. Many of these battalions trained on fires tasks when not deployed but only trained to a level of certified platoons at best.[32] These units did not have the time to train artillery tasks beyond the platoon level because they curtailed their artillery training cycles to concentrate on their in-lieu-of mission. To accomplish their training most units acquired equipment to train on at home station and deployed to theater to draw theater provided equipment to accomplish their deployment tasks.[33]

To highlight the negative effects that in-lieu-of missions and transformation had on the FA force, former maneuver brigade commanders COLs Sean MacFarland, Michael Shields, and Jeffrey Snow penned a white paper entitled The King and I. These former brigade commanders outlined the degradation of the FA community's artillery competency. They pointed to data published by the combat training centers that showed worrisome trends with regards to fires battalion training readiness.[34] Additionally, "The King and I" white paper describes the training deficiencies that resulted directly from the elimination of the DIVARTY headquarters and from moving FISTs to the maneuver battalions from the FA battalion.[35]

Future Army Doctrine

The U.S. Army, in the perpetual effort to continue modernization, developed the concepts for how it would conduct operations in the future. The U.S. Army developed their emerging doctrine based on the concept of a hybrid threat and encapsulated the new ideas in the AOC. Following release of the AOC, the FA community produced the Functional Concept for Fires (FCF). This section will review literature related to hybrid warfare and then provide a detailed review of the AOC and the FCF. By the end of this section, the reader should have a firm understanding of the hybrid threat and the doctrinal changes proposed under the AOC and the FCF.

Hybrid Warfare

Before the U.S. Army doctrine writers could embark upon the difficult task of updating its future doctrine, the writers had to define the potential threats to the U.S. Army in the future. The doctrine writers used a concept similar to the hybrid threat to define the future threat to the U.S. Army.

The concept for the hybrid threat is most attributed to Frank G. Hoffman, in his book Conflict in the 21st Century: The Rise of Hybrid War. Hoffman was a research fellow at the Center for Emerging Threat and Opportunities at the Marine Corps Combat Development Command and an employee of the Potomac Institute for Policy Studies.[36] Hoffman points out in his book and other subsequent writings that the West's enemies spent the last 10 years in Iraq and Afghanistan studying ways to defeat western armies.[37] He described hybrid warfare as "wars that incorporate a range of different conventional capabilities, irregular tactics and formations, and terrorist acts"[38] to achieve synergistic effects and attain political objectives.[39]

In his original book and other writings about hybrid warfare, Hoffman points out the adaptability of the hybrid threats. As an example of this adaptability, he pointed out the willingness to abandon traditional forms of warfare in favor of highly effective and violent irregular techniques such as those used by Iraq's Fedayeen in 2003.[40] He also used the example of the battles between Hezbollah and the IDF, where Hezbollah demonstrated an uncanny ability to deconstruct the IDF's advantages through the adaptive use of state-sponsored technologies.[41]

Major Larry Jordon, a 2008 Command and General Staff School student, examined how well the U.S. Army is prepared for a hybrid threat. He concluded that hybrid warfare would not completely replace or negate the existence of conventional warfare. Jordon further defined hybrid warfare as "a combination of traditional, irregular, destructive and disruptive tactics."[42] This definition was an adaptation of Hoffman's theory and highlighted the important concept that hybrid warfare and threats do not mean the end of conventional warfare.

The AOC does not specifically acknowledge the existence of a hybrid threat by name, but the future threat environment described by the AOC is very similar to the ideas expressed by Hoffman. The AOC described the future threat environment as one where both state and non-state adversaries use current and advanced technologies such as the improvised explosive device (IED) and frequency-hopping radios and cyber attacks.[43] Further inspection of the AOC revealed further agreement with Hoffman's belief that future threats will demonstrate a willingness to adapt in order to avoid U.S. Army advantages in technology.[44]

In summary, the U.S. Army can expect to face, in future combat, hybrid threats that are not necessarily as well equipped, but are more adaptive and possess some form of advanced technology. Additionally, the emergence of hybrid threats does not negate the possibility of conventional warfare; it simply makes conventional warfare more difficult due to the additional threat in the rear area from irregular forces.

The Army Operating Concept and the Functional Concept for Fires

The AOC released in 2010 delineated for the U.S. Army what changes would occur in U.S. Army doctrine for land warfare. This section will first provide background into the reasoning behind the proposed changes in U.S. Army doctrine. Then with respect to fires, this section will describe the implications for the FA in both the AOC and the FCF. These requirements will shape the FA for the future and are important for the considerations in this thesis.

The AOC replaced the concepts of High Intensity Conflict (HIC) and Low Intensity Conflict (LIC) with the concept of CAM and WAS and reaffirmed the concept of FSO.[45] Previously, HIC was thought of as a major theater war (e.g. defending western Europe form the Warsaw Pact) and LIC referred to stability operations (e.g. operations in Kosovo). The U.S. Army and the FA to this point were organized for a HIC fight under the concept of EBO. Lessons from the conflicts in Iraq and Afghanistan showed that even operations thought of by many as stability operations or LIC could become very intense indeed. Clarification was needed for the warfighter and for the development of doctrine and acquisition of materiel.

Besides defining future warfare into the categories of CAM and WAS, the AOC required future U.S. Army forces, to include the FA, to possess the quality of operational adaptability.[46] Operational adaptability is defined in the AOC as "A quality that Army leaders and forces exhibit based on critical thinking, comfort with ambiguity and decentralization, a willingness to accept prudent risk, and ability to make rapid adjustments based on a continuous assessment of the situation."[47] The concept of operational adaptability was further expanded in the AOC as a requirement for units to transition rapidly between CAM and WAS. This requirement was based on the predilection that the enemy would rapidly adapt to situations to avoid U.S. Army strengths in hybrid warfare.

The FCF expands the concept of operational adaptability and the requirement for a rapid transition between CAM and WAS in the new concept of scalable capabilities. The concept of scalable capabilities eliminates the terms lethal and non-lethal fires and presents the idea of a spectrum of capabilities that produce lethal and non-lethal effects.[48] The lethal portion of the scalable capabilities includes suppressive, conventional munitions and PGMs.[49]

The final aspect of operational adaptability and a requirement for the FA in the AOC is the ability to task organize for both fires and non-fires tasks.[50] This requirement precludes the existence of a single-purpose FA force and solidifies the in-lieu-of missions performed by the FA in both Iraq and Afghanistan. No longer can the FA expect to only deliver fires.

While the AOC and FCF include many new concepts, they also codify some traditional aspects of the FA. These include the ability to rapidly clear joint fires, deliver

offensive and defensive fires, locate enemy targets, and detect enemy indirect fire threats. Together, these requirements are not new to the FA and instead represent core competencies. However, the AOC expands these core competencies to include the detection of all enemy air threats (an air defense artillery competency), and the requirement to task organize at lower levels to provide distributed offensive and defensive fires throughout the area of operations (AO).[51]

In summary, the future U.S. Army doctrine as delineated in the AOC and the FCF possessed some changes to previous doctrine, codified some of the missions conducted in the Iraq and Afghanistan, and introduced new concepts to address future threats. The term operational adaptability is new to the U.S. Army but adaptability is not. The AOC definitively placed a requirement upon the FA to include the in-lieu-of mission in Iraq and Afghanistan into future training. However, some aspects of the FA did not change. The FA is still required to identify targets, detect enemy threats, provide fires, and clear fires.

Conclusion

This chapter described the development of FA doctrine, organization, training, and materiel since the implementation of Active Defense doctrine in the 1970s. This chapter highlighted the ideas and reasoning for how the FA is currently organized, used, and equipped. Finally, this chapter described the future threats to the U.S. Army and described how AOC and the FCF will direct future doctrine. With this information, the analysis chapter of this thesis will expand upon these concepts and identify how future concepts will impact the FA based upon past development.

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[9]John W. Beaver, "An Analysis of Alternatives to Verbal FM Radio Tactical Communications" (Thesis, Command and General Staff College, Fort Leavenworth KS, 1975), 42-43.

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[24]Brock, 31.

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[32]"Silhouetes Fires Center of Steel" (November/December 2010): 23-51; "Silhouetes of Steel" (November/December 2009): 17-29.

[33]"Silhouetes Fires Center of Steel" (November/December 2010): 23-51; "Silhouetes of Steel" (November/December 2009): 17-29.

[34]Sean MacFarland, Michael Shields, and Jeffery Snow, "The King and I: The Impending Crisis in Field Artillery's Ability to Provide Fire Support," White Paper, 1.

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[37]Ibid., 12.

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[39]Ibid.

[40]Ibid,. 28.

[41]Frank G. Hoffman, “Hybrid Warfare and Challenges,” *Joint Forces Quarterly* no. 52 (1st Quarter 2009): 37.

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[43]Department of the Army, TRADOC Pam 525-3-1, 8.

[44]Ibid., 9.

[45]Ibid., iii.

[46]Ibid., 3.

[47]Ibid., 61.

[48]Department of the Army, TRADOC Pam 525-3-4, 10.

[49]Ibid.

[50]Department of the Army, TRADOC Pam 525-3-1, 52.

[51]Ibid.

CHAPTER 3

METHODOLGY

> Future Army forces require operationally adaptable organizations with the capability to task organize with fires and nonfires capabilities to conduct a wide range of missions in full-spectrum operations.
>
> — The Army Operating Concept

This simple quote from the AOC, demanding the FA to have the ability to conduct both fires and nonfires tasks, but does not appreciate the complexity of actually training and equipping the FA to complete these tasks. In an attempt to tackle the very complex problem of "training for anything," this thesis will use a capabilities-based assessment to compare the current FA force capabilities and the future requirements to answer the question: can the FA adapt to the new AOC? This chapter, through thesis framework overview, will lay out the methodology used in the thesis to answer the primary question. Additionally, this chapter will explain capabilities-based assessment and provide details of the specific aspects examined to determine recommendations for changes needed for the FA to adapt to the AOC.

Thesis Framework Overview

In order to answer the primary question, this thesis already drew upon information in the research material to identify the tasks that FA units must accomplish. This material included current FA requirements and capabilities based upon organization, training, and materiel. Then, the literature review explored the AOC, potential threats in the hybrid warfare construct, to determine future FA force requirements. Using the information provided by the literature review, chapter 4 will compare the current force structure with

future force requirements to determine where gaps may exist. Finally, this paper will find the best ways to manage these gaps so the FA can fulfill all of the requirements outlined in the AOC.

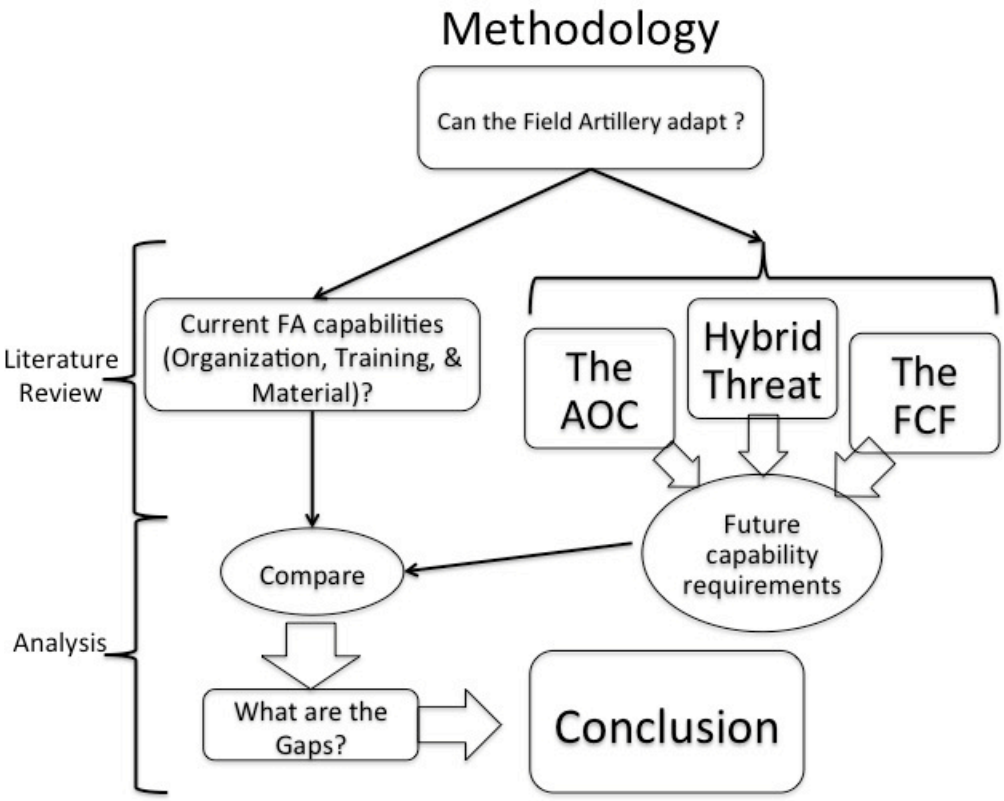

Figure 1. Methodology Diagram

Source: Created by author

Research Criteria

To thoroughly examine all of the materials, this paper will specifically review past and current doctrine to evaluate FA, organization, training, and materiel. This paper

draws these from the Joint Capabilities, Integration, and Development System (JCIDS). The JCIDS is the joint process the Department of Defense (DOD) uses to assess and identify changes required for the entire force. JCIDS breaks down the problem set into seven specific areas; doctrine, organization, training, materiel, leadership, personnel, and facilities. By taking the first letter of each area, these domains are commonly referred to collectively as DOTMLPF.

To succinctly examine the central issues in this paper, this paper limits its scope to just the organization, training, and materiel aspects of DOTMLPF. The AOC and the FCF have delineated new doctrine for the FA, therefore this paper will not delve into proposed changes to FA doctrine. The area of doctrine, however, is examined solely to provide background into the development of the current force structure and to examine possible changes in organization, training, and materiel for the future. The paper will examine aspects of how FA units are organized, which will serve to address whether current organizations can fulfill the requirements of the AOC and FCF. The area of training will examine the methodology used to prepare FA organizations for combat in peacetime and the Army Force Generation (ARFORGEN). Finally, this paper will examine the equipment or materiel used by the FA to accomplish missions and attempt to identify any materiel shortcomings that would present difficulties in complying with the AOC and FCF.

Conclusion

In conclusion, this paper will address the primary and secondary research questions in three steps. First, background information will set the stage and clearly define the current state of affairs. Second, the paper will review the AOC, the FCF, and

articles related to hybrid warfare, to identify future missions required of the FA. Finally, this research will examine the gaps between present organization, training, and materiel and future requirements to provide recommendations for the future FA force.

CHAPTER 4

ANALYSIS

> Future Army forces require offensive fires that preempt enemy actions by interdicting, degrading, defeating, and destroying enemy capabilities and defensive fires that defeat enemy capabilities and protect friendly forces, population centers, and critical infrastructure, to preserve combat power and freedom of movement and action, protect the force, and allow friendly forces to gain, maintain, and exploit the initiative.
>
> Department of the Army,
> TRADOC Publication 525-2-1, *The Army Operating Concept*

Introduction

As the FA looks to the future, the branch must first understand its current situation, obtain a complete understanding of future requirements, understand where capability gaps exist, and then develop solutions. This thesis used a similar methodology to provide recommended solutions to the challenges the FA will face in the future. The first part of this chapter examined the past and current doctrine to determine the current capabilities. Then this chapter closely examined the AOC, the FCF, and hybrid warfare to identify future capability requirements for the FA. Finally, this chapter identified capability gaps in the FA to help answer the central question of this thesis: can the FA adapt its organization, training, and materiel to the new U.S. Army Operating Concept and remain relevant?

Current Field Artillery Capabilities

The FA underwent significant changes under the transition from division-centric doctrine of ALB and EBO to the brigade-centric modularity concept. Many of the changes in the U.S. Army were simple name changes. For example the FA Battlefield

Operating System was renamed the Fires War Fighting Function (WFF) and the FA battalion (BN) was renamed a Fires BN.[1] The remainder of this section will detail the Fires WFF capabilities in the domains of organization, training, and materiel that are relevant to this thesis.

Organization

Presently, the U.S. Army has completed its transition from the ALB doctrinal formations to three types of modular brigade combat teams; the heavy brigade combat team (HBCT), the infantry brigade combat team (IBCT), and the Stryker brigade combat team (SBCT). The HBCT and IBCT were formally the heavy and light brigades under ALB doctrine. Under modularity, the FA battalion was renamed the Fires BN. The Fires BNs in the modular brigades, however, changed more than their name. Under modularity, the Fires BN in the HBCT shrank from a 3-by-6 formation with eighteen howitzers to a 2-by-8 organization with only sixteen howitzers. More importantly, modularity eliminated two FDCs for a total of four FDCs. The IBCT Fires BN also shrunk from 3-by-6 to a 2-by-8 formation but gained 2 FDCs for a total of four.[2] The SBCT Fires BN completed fielding of the M777A2 howitzer and grew from 3-by-4 with twelve howitzers to a 3-by-6 organization with eighteen howitzers, gaining three FDCs in the process.

The Fires BN and the brigade combat team were not the only organizations altered under modularity. In the new modularity scheme, the Division Artillery headquarters (DIVARTY) was eliminated and the Field Artillery Brigade was renamed a Fires Brigade.[3] Within the Fires Brigade, the U.S. Army reduced the brigade to only 2 Fires BNs in a 2-by-8 configuration and eliminated most of the cannon battalions, leaving the Fires BDEs with a PGM capable MLRS or HIMARS. Fires Brigades were, however,

given a number of enablers such as robust communications packages and their own logistical support organization to support the brigade's operations.[4] In all, the Fires Brigade had fewer systems to fire with but gained some capacity in its ability to deliver PGMs and better communications.

Training

The loss of the DIVARTY represented a significant loss to the training readiness of the Fires BNs within the BCTs. Without a senior artillery commander to help provide training oversight for the battalion headquarters and batteries, coupled with the larger number of Fires BNs conducting in-lieu-of missions, the training readiness of the Fires BNs quickly degraded.[5] Fires BNs currently train based upon their mission set for the upcoming deployment. When conducting artillery-specific training they use the artillery training tables set forth in Combined Arms Training Strategy portion of the Army Training Network. When training for in-lieu-of missions, Fires battalions use the same resources to find training tasks, however they draw tasks from the relevant war fighting function to their in-lieu-of tasks. Even with this system, Fires BNs still are not arriving at CTCs at high level of readiness.[6] To mitigate the training issues Fires BDEs established training readiness authority (TRA) over BCT level Fires BNs to fulfill the role of senior artillery trainer for the units.[7]

The training of the Fires BN was not the only aspect of the fire support system that suffered under modularity. In the new BCT organization the FISTs, assigned to the FA BN in ALB doctrine, were assigned to the specific maneuver units they supported. The responsibility for their training readiness rested solely in the hands of the maneuver commander. This change resulted in a deterioration of the training and readiness of the

forward observers as noted by observations of Observer Controllers at the CTCs,[8] but resulted in better integration within the supported unit.

Materiel

The FA underwent many changes, but some aspects remained the same. Fires BN under modularity still use many of the weapon systems developed under ALB. The venerable Paladin and MLRS proved their usefulness in today's conflicts through the employment of PGMs. The same digital fire control system that gives the Paladin the ability to occupy, process and conduct fire missions, and quickly displace under ALB, gives it the ability to employ PGMs such as the Excalibur today. Similarly, the MLRS and its digital fire control system enable it to fire a guided rocket with a range of 70 KM and the ATACMS with a range of approximate 300 KM.

In addition to the Paladin and the MLRS, the U.S. Army employs the M119A2 105mm light howitzer in the IBCT and the M777A2 in the SBCT and some Fires BDEs. Both of these weapons have demonstrated their reliability and accuracy in operations in both Afghanistan and Iraq. However, the issue of protection and mobility that was a consideration for the development of the Paladin remains an issue with these newer systems. Unarmored trucks tow both the M119A2 and the M777A2. In the SBCT, a cargo truck tows the M777A2 but is unable to maintain a rate of movement equivalent to that of the Stryker.

Outside of the Fires WFF, the U.S. Army developed materiel solutions to problems that plagued the U.S. Army since the development of ALB. The first of these solutions was related to locating friendly units on the battlefield and communicating up and down the chain of command to gather information and issue orders. The U.S. Army

developed digital command and control systems centered on the Force 21 Battle Command Brigade and Below (FBCB2) system. The FA developed systems like TACFIRE and AFATDS to address this same issue under ALB. With FBCB2 the U.S. Army would enable a better understanding of the friendly and enemy situation. Another materiel solution sought by the U.S. Army was the continued development of unmanned aerial vehicles (UAVs), another FA initiative during the development of ALB doctrine. The UAVs developed prior to and since modularity gave the maneuver commander unparalleled access to real-time information about enemy formations. Coupled with the superior communications with FBCB2, the U.S. Army and specifically the FA possessed the tools needed to better apply their firepower against the enemy.

Current Field Artillery Capabilities Summary

In summary, the Fires WFF emerged from modularity drastically different than it looked under ALB. The Fires BN had fewer howitzers and launchers, and with fewer FDCs. Training for the Fires BN suffered in the absence of a DIVARTY. Similarly the training readiness of FISTs declined due to an assignment to the maneuver force coupled with years of work outside of their core competencies. Units have addressed both of these training shortfalls with ad hoc solutions to involve Fires Brigades in the training and collectively training FISTs under the Fires BN. The Fires WFF and the U.S. Army, under modularity, incorporated more technology to obtain a better friendly unit situational awareness and enemy target acquisition, Therefore, although the Fires WFF was organizationally smaller, it was better equipped to apply the firepower it did have to the critical point on the battlefield.

Future Requirements

The Army Operating Concept and the Future Concept for Fires

The AOC identified specific requirements for the Fires WFF. These requirements were possess operational adaptability, rapidly clear of fires, detect enemy threats, locate enemy targets, and provide access to organic and joint fires across the entire area of operations. The remainder of this section will expound upon the six requirements in the AOC in conjunction with the interpretation of these requirements in the FCF.

The AOC's first requirement for the Fires WFF is encapsulated by the idea of operational adaptability. The AOC defined it as "a quality that Army leaders and forces exhibit based on critical thinking, comfort with ambiguity and decentralization, a willingness to accept prudent risk, and ability to make rapid adjustments based on a continuous assessment of the situation."[9] According to the AOC, operational adaptability represents a quality that units and leaders must have to operate in ambiguous situations. The FCF addressed this requirement by recognizing the need for FA organizations to have a proficiency in both fires and non-fires tasks. This represents an acknowledgement by the FA community that to a degree the in-lieu-of missions conducted in Iraq and Afghanistan will continue into the future. The FCF has another perspective on operational adaptability in that it represents the ability to provide non-lethal and lethal fires, or in the new parlance scalable capabilities.[10] To the FCF, scalable capabilities represents the ability to apply effects across a wide range of situations and it necessitates the ability to provide a range of fires from PGMs to destructive and suppressive fires.[11] Essentially, scalable capabilities are the range of effects the FA must provide to enable maneuver force to gain, maintain, and exploit the initiative. In summary, adaptability for

the Fires WFF means having the ability to task organize for both fires and non-fires tasks and possessing the ability to provide a range of munitions from PGMs to massing the Fires BN to suppress or destroy targets.

To effectively employ any munition, be it conventional or a PGM, the Fires WFF must rapidly clear the ground where the munitions will land and the airspace through which the munitions will travel. Clearing the ground by working with the maneuver forces and with existing systems remains difficult but is not insurmountable. The digital systems envisioned during the development of ALB and EBO were designed to assist with this very issue. These systems were also designed to manage the Airspace Command and Control (AC2) but problems with clearing airspace still exist.

Another requirement the AOC placed on the Fires WFF is the need to employ organic and joint fires; either centralized in a CAM operation or decentralized in WAS operation. The requirement to provide access to organic and joint fires in a CAM operation is consistent with historical FA doctrine and missions. Providing decentralized access to a wide area is relatively new and was not considered a requirement in ALB or EBO doctrine. While many units in Iraq and Afghanistan task organized to the platoon minus level to provide this capability, it was done with significant risk for firing incidents and required additional equipment since both units organized under modularity lacked the fire direction capacity to employ more than three separate organizations.

The final requirement in the AOC is the capability to detect incoming threats and acquire targets. Specifically, the Fires WFF must acquire both incoming fires and airborne threats typically associated with the air defense community. With the air defense

artillery included in the Fires WFF, existing systems, and planned updates to existing systems, this requirement is an update to an existing capability in the Fires WFF.

The Hybrid Threat

To further define the future requirements for the FA, this thesis will summarize the anticipated capabilities from the mostly likely threat the U.S. Army will face in the future. While there is no guarantee the U.S. Army will face such a threat, in fact if history is any lesson assumption about a future threats is likely incorrect. However, assumptions about future threats are necessary for future force development. Based upon recent U.S. Army experiences in Iraq and Afghanistan, and the enemy the IDF faced in Lebanon, the AOC identified several capabilities expected by the future hybrid threat. It is expected that any future U.S. Army adversary will be an adaptable enemy with an unmanned aerial vehicle capability, the ability to disrupt our information network, and a significant anti-armor capability. Also, future U.S. Army adversaries could be a non-state actor such as Al Qaeda or traditional state actor supported by a non-state organization.

The potential threat capabilities of a future adversary will help identify future capabilities for the Fires WFF. To counter the adversary UAV and target acquisition capabilities, the FA must still consider counter-fire a significant threat in future conflicts. In addition to the counter-fire threat, the Fires WFF must consider ways to counter adversarial UAV threats.

In addition to target acquisition capabilities, a future adversary will attempt to disrupt our information dominance. They may accomplish this by using electronic warfare to jam communications such as Hezbollah did with the IDF. Additionally, a

future adversary may try to disrupt the global positioning satellite (GPS) system used extensively by the U.S. Army and the FA.

Future adversaries may also attempt to negate the U.S. Army's advantage in armored vehicles by obtaining modern anti-tank weapons such as the ones used by Hezbollah. Also future adversaries may try to replicate and improve upon the IEDs used with success by insurgents in both Iraq and Afghanistan. No matter which technique they use, a future adversary will have a form of anti-armor capability.

Finally, any future adversary to the U.S. Army may combine a state-like threat such as a standing uniformed army with a non-state actor. Therefore, future U.S. Army operations may include a conventional front line with an insurgency or terrorist in the rear area.

Future Requirements Summary

In summary, the future threat the U.S. Army expects to face will attempt to negate any perceived advantage the U.S. Army presently has. Adversaries will attempt to negate our information dominance by attempting to disrupt the digital communications and navigation infrastructure. They will attempt to neutralize any advantage in armored vehicles through the employment of anti-tank weapons or IEDs. Furthermore, adversaries will attempt to use forms of target acquisition to locate friendly forces and target them with indirect fires. Finally, the enemy will seek victory by trying not to fight on the terms dictated by the U.S. Army.

Three Imperatives for the Future Fires War Fighting Function

The future for both the U.S. Army and the Fires WFF is as difficult to comprehend, as it is to predict. To simplify matters, this thesis will synthesize the future force requirements from the AOC and FCF with the future threats according to theories about future threats to the U.S. Army. This synthesis derives three imperatives for the Fires WFF to consider as leaders seek organization, training, and materiel solutions to future challenges. These three imperatives are; the Fires WFF must possess the capability to rapidly transition between CAM and WAS; second, the Fires WFF must be able to task organize for fires and non-fires tasks; and finally the Fires WFF must rapidly provide access to organic and joint fires across the entire area of operations. Some of these concepts are derived directly from the AOC and FCF, but together they best summarize the requirements for the Fires WFF into the future. The remainder of this section will detail how the future force requirements from the AOC and the FCF coupled with the Hybrid threat translate to the three imperatives.

The first imperative, the Fires WFF must have the ability to rapidly transition between CAM and WAS is taken directly from the AOC. It is a tenant of operational adaptability, but it also recognizes the U.S. Army will likely face an adaptable threat that will focus their efforts on areas of perceived U.S. Army weakness. Additionally, the U.S. Army will face a threat that may have traditional military technologies like UAVs but behave more like an insurgent force.

The second imperative for the Fires WFF is the ability to task organize for fires and non-fires tasks. This is also a tenant of operational adaptability but address the likelihood that a future adversary will conduct operations to destabilize the rear areas of

any friendly operation. The Fires BNs can no longer assume firing points in either CAM or WAS are secure. Nor can Fires BNs assume commanders will allocate forces to provide security for the Fires BN. There is requirement within the Fires BN in both CAM and WAS operations to conduct security operations in addition to normal fires tasks. In conducting these missions, Fires BNs can expect the enemy to maximize the effect of rear area operations with the use of IEDs, ATGMs, and threats against civilian targets. In essence, the in-lieu-of mission many Fires BNs performed in Afghanistan and Iraq will remain a requirement in the future.

The third and final imperative for the Fires WFF, to rapidly provide distributed fire support throughout the area of operations, is a combination of three requirements from the AOC and FCF. This imperative entails the capability to rapidly employ fires by clearing airspace and gaining clearance of fires from maneuver commanders. This imperative also requires the Fires WFF to detect and engage enemy airborne threats in addition to acquiring targets for surface fires. Finally, this imperative demands the Fires WFF provide supported maneuver force access to joint and organic fires.

In summary this section described the three Fires WFF imperatives for future considerations in regards to organization training and materiel. These three imperatives synthesize the future force requirements from the AOC and FCF, with the future threat capabilities envisioned by assumptions about hybrid threats. The next section will examine the impacts each of these imperatives have on the current Fires capabilities with regards to organization, training, and materiel.

Current Capabilities and Future Force Requirements Comparison

Incorporating the future requirements within the Fires WFF has implications in all the domains of DOTMLPF but this thesis will continue to focus on the domains of organization, training, and materiel. The remainder of this section describes how the three Fires WFF imperatives impact upon these domains and examine where gaps exist between current capabilities and future requirements.

Organization

All three of imperatives for the Fires WFF require a flexible organization in the Fires BN. These battalions require the capacity to task organize for fires and non-fires tasks, while retaining the capacity to task organize at lower levels to provide distributed fire support. Flexibility in these organizations increases proportional to the number of FDCs and headquarters in the battalion. Each additional FDC represents an additional capability to establish a firing point since FDC and howitzer communication is limited to line of site communications. Additionally, in non-fires tasks an additional battery headquarters provides for another element to oversee tasks within the battalion's area of operation.

Training

Adaptations within the Fires BN are not limited to organization. The training methodologies used in these organizations must adapt to the future requirements. To accommodate the first Fires WFF imperative to rapidly transition between CAM and WAS Fires organizations must rapidly transition from a BN centric organization in CAM operations to platoon operations for WAS operations. Also, to satisfy the scalable

capabilities portion of operational adaptability, firing elements and fire support planning elements must possess a proficiency at utilizing both suppressive fires and PGMs. In addition to providing artillery fires, fires organizations must develop proficiency in non-fires tasks as well to satisfy the second imperative of the fires WFF. Therefore, Fires BNs and BDES must incorporate patrolling and crew served weapons training into their training plans. Finally, Fires BNs must train FISTs and fire support elements how to acquire targets, rapidly clear airspace to employ both joint and organic fires.

Materiel

The Fires WFF must adapt more than organization and training to accommodate future force requirements. In order to address the first imperative, the Fires BNs and BDEs must have vehicles that match the mobility of their maneuver counterparts. Additionally to address the threat of IEDs and provide the capability to conduct non-fires missions Fires BNs must have protected vehicles that can operate in an unsecure environment.

A potential technological solution to the number of FDCs within a Fires BN is to increase the digital capacity for the fire direction systems to remotely manage howitzers. In some respects these systems have changed little since the advent of TACFIRE under ALB. Current systems are still limited to line-of-site communications with the howitzers and thus limits the range from the howitzer to the FDC.

Capability Gaps

Organization

The three Fires WFF imperatives require a degree of flexibility not present in all Fires BNs. The elimination of two FDCs in the HBCT and a battery headquarters in both the IBCT and HBCT reduced these organizations' capacity to direct fires from multiple locations and a degree of flexibility needed to perform multiple type missions. In addition to the issue with FDCs and battery headquarters, the reduction of two howitzers per HBCT and IBCT Fires BN further reduces their capability to provide distributed fires assets to their brigade.

Until there is a solution to the limited range of digital line of site communications, the limited number of FDCs limits the number of distributed firing points a battalion can support. Additionally, the sixteen guns in a battalion limits the battalion to only 8 potential firing points which is not enough according to COLs Waters and MAJ Swan to provide fire support coverage for an entire brigade area of operations.

Training

The most difficult task for Fires BNs is including additional non-fires training tasks into an already lengthy fires training plan. Current units find time to train for in-lieu-of missions by only training FA gunner up to section or platoon level. These units then focus on their in-lieu-of mission tasks for the remainder of the year. Including training tasks on patrolling and other security related tasks would certainly complicate an already difficult training plan.

Materiel

Most of the current howitzers and launchers possess an adequate level of mobility commensurate with their supported maneuver force. However, none of the current systems have the necessary protection to operate in a hybrid threat environment. Nor can units effectively use any of the current systems to conduct patrols in WAS operations.

Conclusion

Analysis of the current FA force revealed that Fires BNs are smaller than FA organizations under ALB doctrine but they have more capacity to process information and target the enemy. Then in this chapter the analysis of the AOC, FCF, and the hybrid threat anticipated in the future revealed the three Fires WFF imperatives which were; the Fires WFF must rapidly transition between CAM and WAS, the Fires WFF must task organize to conduct both fires and non-fires tasks, and finally the fires WFF must provide rapid access to distributed joint and organic fires. Using this analysis, this chapter identified several gaps between the current for and the future force requirement. The next chapter will identify recommendations to resolve these capability gaps.

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[1]Brock, 31.

[2]Ibid.

[3]Ibid.

[4]Nicolle, 14.

[5]MacFarland, 1.

[6]Ibid.

[7]Nicolle, 14.

[8]Ibid., 2.

[9]Department of the Army, TRADOC Pam 525-3-1, 61.

[10]Department of the Army, TRADOC Pam 525-3-4, 10.

[11]Ibid., 12.

CHAPTER 5

RECOMMENDATIONS AND CONCLUSIONS

> The central idea of Unified Land Operations is that Army units seize, retain, and exploit the initiative to gain and maintain a position of relative advantage in sustained land operations to create conditions for favorable conflict resolution. .
>
> — General Raymond T. Oderirno,
> Army Doctrine Publication 3-0, *Unified Land Operations*

Introduction

The research for this thesis centered on the central question, can the FA adapt its organization, training, and materiel to the AOC and remain relevant. The research and analysis for this thesis outlined the driving factors for past FA development, analyzed the current FA force, identified future requirement based upon the AOC, the FCF, and the hybrid threat. With this information the thesis defined the three imperatives for the Fires WFF and identified gaps between future requirements and the current force. In spite of the gaps in organization, training, and materiel this thesis concludes that yes, the FA can accommodate these changes and remain relevant if FA leaders consider the following recommendations going forward into the future.

Recommended changes to the Fires Battalion Organization

To accommodate the three Fires WFF imperatives, the Fires BN must develop a more flexible organization that can occupy multiple small firing points to greatly distribute its affects across the entire AO or mass the battalion against a singular target. To accomplish this, the Fires BN needs at least eighteen howitzers and enough FDCs to accommodate a minimum of six, three gun firing points. The eighteen howitzers coupled

with other indirect systems within the BCT can provide adequate fires coverage and still collectively supply suppressive fires required under the requirement for scalable capabilities.

Recommended Changes to Fires Battalion Training

Training a Fires BN under future requirement will likely be the most difficult task to accomplish within the FA community, but it is not impossible. As battalions prepared for operations in either Afghanistan or Iraq, units were able to train to a section or platoon level of proficiency and then focus on in-lieu-of mission or non-fires tasks. Prior to embarking on a training regime, Fires leaders must first understand which non-fires tasks their BCT commander needs from the Fires BN. Then battalions can incorporate these training tasks into their artillery training tables. For example instead of simply scheduling a week to conduct crew served weapons training and qualifications in artillery table III, units can add a week of un-stabilized and stabilized machine gun gunnery from their vehicles in accordance with the Light Cavalry Tables found on the Army Training Network. As the units complete their platoon level artillery training they can add two weeks of patrolling to achieve a platoon level competence at security operations. Following this additional training Fires battalions can resume their path to battalion level gunnery. As a capstone event, units can incorporate patrolling into platoon and battery level situational training exercises.

Recommended Changes to Fires Battalion Materiel

Before Fires BNs can include training on security level tasks they must have the appropriate equipment with which to train. As the U.S. Army and Fort Sill continue their

quest to acquire new equipment for the future, they certainly need to keep a keen eye upon the relevant factors that led to the development of systems under ALB. Similar to enemy doctrine in ALB, the hybrid threats still possess a counterfire threat, but it has the additional threat of IEDs or ATGMs. Presently, the light community will likely benefit from the acquisition of the Joint Light Tactical Vehicle as a prime mover for the M119A2 howitzer, which would have protection against IED and some anti armor threats. The SBCT Fires BN, however will continue to lack a viable prime mover that has mobility and protection similar to their maneuver counterparts. To solve this problem the FA should adopt a Stryker vehicle prime mover to move their M777A2 howitzers. This vehicle would certainly provide mobility and protection equal to their maneuver counterparts.

Areas for Further Research

A review of the future force requirements and the three imperatives for the Fires WFF reveal one area not discussed in the recommendations; the requirement to rapidly clear airspace. This requirement deserves further investigation not within the scope for this paper. The AOC moves the Air Defense Artillery (ADA) branch from the Protection WFF to the Fires WFF. This move may facilitate a quicker airspace clearance in the future if BCTs, with the support of the ADA in the Fires WFF, develop a positive airspace control capability. That would represent a significant improvement over the current procedural control used by BCT today. Positive control is appealing to BCTs since it involves controllers actively talking to and controlling aircraft, as practiced by civilian air traffic controllers near airports. The current process of procedural control relies on units placing areas of airspace off limits to aircraft, however the process to

establish these areas is lengthy and relies upon elements outside of the BCTs control to implement. Further research is needed to investigate if it feasible for BCTs to utilize positive airspace control within their area of operations.

Conclusion

In conclusion, while the Fires WFF must continue to possess the unique capability to influence the battlefield in support of the commander. The Fires WFF must remain dedicated to its roots. That is the members of the Fires WFF must be experts in tactics, be dedicated to providing fire support for the maneuver commander, and be in their hearts not just field artilleryman but fire supporters. As the maneuver commander moves within their AO, the fire supporter must travel by his side always ready to provide sound advice on the use of fires and ready to translate the commander's intent and maneuver plan into the fire support plan. At the end of the day, as long as the maneuver commander can trust that his fire supporters are trained in the required tasks and that the guns fire effectively in support of the young infantryman on the ground regardless of the weather or the tactical situation, the FA will retain its relevance on the modern battlefield.

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