FORWARD SUPPORT TO THE DIGITIZED DIVISION OF FORCE XXI

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

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This study investigates the structure of the digitized division, which was approved by the Chief of Staff of the Army in 1998. Specifically this study will address whether or not the combat service support (CSS) concept developed by the combined arms support command (CASCOM) to support the new division design is effective. The concept presented is one that is based on dispersed logistics and is distribution based instead of supply based. The intent of the study is to ensure that in an effort to make logistics more efficient it did not become less effective. The emphasis is on providing flexibility to the maneuver commander and simplifying the military decision making process (MDMP).

The division support command (DISCOM) was restructured to support the new CSS concept. The most significant change was the redesign at the battalion level. The support platoons from the maneuver battalions have been put into the forward support battalion (FSB) under the command and control of the logisticians. The FSB was also restructured to facilitate multifunctional companies that would be in direct support to the maneuver battalions.

The study explains the implications of the restructuring for both the logisticians and tacticians. This study promotes the new dispersed logistics plan based on the enhancement provided by enablers and validates the CSS concept for the digitized division.

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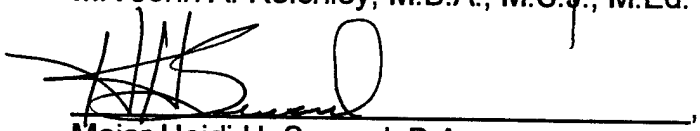

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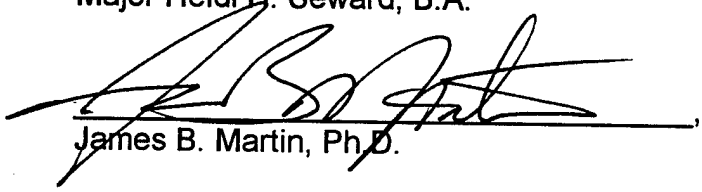

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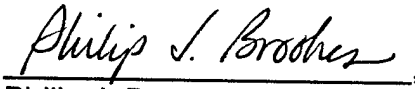

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ABSTRACT

FORWARD SUPPORT TO THE DIGITIZED DIVISION OF FORCE XXI by MAJ Kathryn A. Burba, USA, 80 pages.

This study investigates the structure of the digitized division which was approved by the Chief of Staff of the Army in 1998. Specifically this study will address whether or not the combat service support (CSS) concept developed by the combined arms support command (CASCOM) to support the new division design is effective. The concept presented is one that is based on dispersed logistics and is distribution based instead of supply based. The intent of the study is to ensure that in an effort to make logistics more efficient it did not become less effective. The emphasis is on providing flexibility to the maneuver commander and simplifying the military decision making process (MDMP).

The division support command (DISCOM) was restructured to support the new CSS concept. The most significant change was the redesign at the battalion level. The support platoons from the maneuver battalions have been put into the forward support battalion (FSB) under the command and control of the logisticians. The FSB was also restructured to facilitate multifunctional companies that would be in direct support to the maneuver battalions.

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Most importantly I would like to thank my parents who have always been enthusiastic about my endeavors and continually supportive. My dad has been my greatest teacher and my mom my greatest friend. Finally I must thank my grandmother, the late Doris Perrault who taught me to read and was with me every page along the way.

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CHAPTER 1

INTRODUCTION

Background and Context of the Problem

As the world engages in the information age, access to resources accelerates and the environment takes on a new form. For the Army, Force XXI concepts will be the platform by which future wars are planned and fought. The Army is midway through this journey. In concurrence with the Force XXI vision statement the new division redesign should enhance lethality, survivability, and tempo (Army Vision 2010). Before examining the redesign, it is important to understand the background from which the design came.

Until 1989 the military was robust and focused on winning a global war against another superpower. Once the Cold War ended it was clear that the threat was changing and with that the US was required to reexamine the military's force structure. This process began when the Chairman of the Joint Chiefs of Staff (CJCS), General Collin Powell, designated the existing Army structure as the base force which was called the army of excellence (AOE). All force structure models would begin with this base force as the foundation. The chairman then initiated the Bottom up Review (BUR) to be conducted in 1992 and 1993. "The BUR was not a redesign of the existing force so much as an effort to reassert the consensus on what components of the existing force should be kept" (Strategic Assessment 1997, 17).

The result of the BUR was a new strategy of two major regional contingencies that occur nearly simultaneously. With this strategy there would be a need for robust strategic mobility. The results of the BUR provided two new realizations about the restructuring: it would be expensive, and advanced technology combined with organizational restructuring would provide greater military efficiency. This would prove to be an expensive endeavor as Congress forced the military to readjust funds within the department of defense (DOD) to pay for operations, such as Somalia and Haiti, instead of appropriating extra money as was commonly done in the past.

In the early 1990s it became clear that certain capabilities could be enhanced by technology. Three areas stood out: intelligence collection, surveillance, and reconnaissance (ISR); advanced command, control, communications, computers, and intelligence processing (C4I); and precision force, or weapons that increase the capacity to apply destructive power with greater range, speed, accuracy, and precision. These concepts would certainly enhance efficiency and would also affect the way the new force would operate. It would facilitate a force reduction (mandated by Congress) without reducing the military's ability to win against any threat. This force would become what is known as Force XXI. "Force XXI is the transformed Army of the twenty-first century in its entirety. The central and essential feature of this Army will be its ability to exploit information" (Force XXI 1995, 8).

The reorganization of forces reflected new national security and military strategies. The strategies refocused the DOD on current and emerging threats. These new threats demonstrated new concerns and considerations for the country. The bipolar world had disappeared. The first consideration was that the Army would be based primarily in the continental United States. This would lead to more reliance on air and sea lift and a force projection Army. (Force XXI 1995, 31) Changes in military technology have become what has been coined a "military-technical revolution" which provides depth and transparency to the battlefield. Five major technological developments were identified as immediately and significantly affecting land warfare. They are:

1. Lethality and dispersion
2. Volume and precision of fire
3. Integrative technology
4. Mass and effects
5. Invisibility and detectability.

"These developments will drive adjustments in tactics, organization, doctrine, equipment, force mix, and methods of command and control" (Sullivan and Dubik 1993, iii). Concurrently, the country has become less tolerant of casualties, which results in the necessity to employ military power in an overwhelming way with much precision and in the shortest amount of time.

In a study of land warfare by General Gordon Sullivan and LTC James Dubik they identified the need for smaller units to react to these new capabilities

and threats. If more firepower can be generated per weapon system then fewer soldiers would be required. Smaller units could be task organized with a mix of weapons from different echelons (brigade, division, corps) to maximize efforts and maneuver could produce decisive effects by waging formations consisting of air/ground based units (Sullivan and Dubik 1993, 19-20). In sum, there is indication that "as the size of the unit decreases, there can be a corresponding increase in the effects it is able to produce if it is equipped with the right technology used by high-quality, well trained troops employing proper doctrine" (Sullivan and Dubik 1993, 22).

There are certain characteristics of the Force XXI environment. This is not to be confused with the battlefield framework from which operations will occur. The characteristics mentioned here describe the environment in which the framework will work. The first of these characteristics is that the environment will be quite multidimensional. The battle space will be extended and will go beyond the traditional physical dimensions of width, depth, and height. Also included in the new environment is the electromagnetic spectrum. It extends into joint and coalition forces through the use of digital connectivity. In addition, it extends back to CONUS (Army Division XXI, 1).

The next characteristic is precision. Digitization has enhanced the decision making process by providing information that makes decisions more precise. Also, there are sensors across the battlefield to provide precise situational awareness, and simulations have allowed elements to be more

tailored which has resulted in precise execution (Army Division XXI, 1). The use of precision munitions has also provided the division the ability to better shape the battlefield.

Nonlinear operations move operations away from the close, deep, and rear perspectives. This is a significant difference from the AOE environment. This makes the concept of nonlinear operations a third characteristic. The battlefield is much more fluid and changes quickly. Synchronization of operations is based less on one unit effort supporting the other and geared more toward simultaneous operations. The ability to conduct operations simultaneously is significantly improved over the AOE and is the fourth characteristic of Force XXI. "Simultaneous operations seize the initiative and present the enemy leadership with multiple crises and no effective response" (Army Division, 20).

The last two characteristics are distributed and integrated operations. Distributed operations are effects that are concentrated at a decisive point. This allows units to dispersed across the battlespace and operate independently, thus leading to a more decentralized base. The division will be fully integrated with joint, multinational, non-governmental partners, and the reserve component. The Army will participate in a wide variety of operations in the future. These situations could range from major regional powers that will provide a sophisticated battlefield to paramilitary groups, state sponsored terrorism, weapons of mass destruction, information warfare, or failed states.

> Digitization has allowed for the fusion of information, shared situational understanding, and a level of capabilities integrated that has resulted in a significant increase in lethality through the integration of capabilities into a system-of-systems organization with geometry effects. Situational awareness allows the commander to enter the 'red zone' under conditions of his or her choosing, thus significantly increasing survivability. The ability to operate with precision and clarity of purpose has increased the tempo of operations to a level not previously seen on the battlefield. (29, p.3).

In reviewing the implications of these changes toward logistics one must decide how the new technology might enhance logistics and what restructuring requirements would be necessary to support the new Force XXI environment. To do this for all branches the Army started a series of exercises and experiments to gain a new perspective on future decisive operations and the surrounding environment. Starting in 1992 a series of field experiments began at the platoon level to test Force XXI concepts and slowly progressed to divisional experiments in 1997. These experiments added the identification of vulnerabilities, which were considered during concept development.

Due to significant changes in the structure and battlespace of the division, reconfiguration of combat service support (CSS) was imminent. However, not just the structure would be affected; there became a need for an entire new CSS concept to support the redesign with enablers to facilitate it. The Combined Arms Support Command (CASCOM) became the proponent under the Training and Doctrine Command (TRADOC) for developing that CSS

concept. Six integrated concepts were developed to sustain operations. They are:

1. Anticipatory Logistics and Personnel Support
2. Split-based Operations
3. Sustained Tempo
4. Enhanced Throughput Operations
5. Velocity Management
6. Battlefield Distribution System.

Also incorporated in concept development were lessons learned from operations in the last five years, such as Restore Hope, Restore Democracy, and Joint Endeavor. By combining lessons learned from experiments and experience the Chief of Staff of the Army (CSA) approved a new heavy division redesign. This redesign replaces the support platoon in maneuver battalions with a forward support company from the Division Support Command (DISCOM). This will cause logistics support to look much like the other Battlefield Operating Systems (BOS). In fact logistics is the only BOS that, until the redesign, has been organic to the maneuver battalion. Whether or not this will enhance survivability, lethality, and tempo is being studied and will be addressed more thoroughly in this thesis.

Research Question

After review of the restructuring the precise question is: will the forward support company improve logistics to the maneuver battalions in the brigades of

the division? To properly address that question criteria must be established for evaluating effective logistics (established in chapter six). There must also be a distinction made between efficient logistics and effective logistics. To review whether or not logistics is improved by the restructuring the focus will be on effective logistics, which implies that the tactical unit's needs are 100 percent met. Efficient logistics implies that the tactical unit's needs are primarily met and that there may be some risk involved. Efficiency usually means that all redundancy has been eliminated.

The purpose of this paper is to address logistics in the redesign from both a support and tactical perspective. Subordinate questions follow up the initial research question. What force protection issues arise from the restructuring? What issues exist concerning the effect of logistics restructuring on the tempo of the battle? What sort of flexibility does the new logistics design provide the maneuver battalion commander? If the answer to any of these questions limits the maneuver commander, then what changes could be made to enhance the maneuver commander's options? These subordinate questions will be addressed in support of answering the overall research question in chapter six.

Assumptions

For the purpose of this paper two assumptions must be made. First, it must be assumed that the combat environment as described by TRADOC in TRADOC PAM series 525 is the actual environment units will operate in by the

year 2010. If the environment does not evolve as stated then the concepts in this paper will not necessarily apply.

The second assumption is that any CSS enablers identified in the CSS concept will be funded and successfully developed by the year 2010. If this does not occur there may be many additional risks or recommendations that will not have been identified or addressed in this paper and an additional study of the implications would be necessary.

Definitions

Many terms used in this thesis will have broader definitions than the scope this paper will require. For that reason this thesis will narrow the parameters of the terms that will frequently be referred to. Force XXI: Refers to the armed forces in the years 2000-2010. Battlefield Visualization: Terrain, weather, and enemy. Logistics effectiveness: Enhancement of lethality, survivability, and tempo through sustainment of operations. Non-linear: The entire battlespace rather than the forward line of troops (FLOT). Tempo: More than speed, it is adjustment in rate of operations relative to the enemy's capability to sense and react. Distributed operations: Operations executed where and when required to achieve decisive effects. Seamless logistics: keeping the distribution pipeline transparent to the maneuver battalions.

Limitations

Due to the evolving doctrine surrounding future operations this thesis will be limited in its ability to apply approved doctrine and will be based on proposals

and draft doctrine presented to date. The design currently addresses only a heavy infantry division. Focus will primarily be on logistics that can be provided to the maneuver battalions from within a brigade sector (brigade battlespace in Force XXI terms). Results from experiments will be limited to the Army Warfighting Experiments of 1995 and 1997.

Delimitations

Due to the magnitude of Force XXI and the constraint to finish this thesis by April 1999 the scope will be limited to divisional logistics. Enablers addressed in the CSS concept will be addressed only if logistics at the division level is affected. Research has been restricted to data from 1995-1998. Although there are many opportunities to observe training of the new division (4th Infantry Division) as it rotates through the National Training Center (NTC) research will be limited based on Command and General Staff College (CGSC) guidelines.

Significance of Study

In the foreword of the TRADOC PAM on land combat in the twenty-first century General William Hartzog, then TRADOC Commander, discusses how units are not "over the hump" on required technology for future operations. He challenges soldiers to continue thinking creatively to push the Army into the twenty-first Century. These concepts are new and require many minds to analyze, question, and develop them. If the redesign of the division is to be successful logistics must be evaluated and measured over and over to ensure proper application. War is a high-risk business, and the goal is to eliminate the

enemy's capability to fight without committing friendly forces to decisive operations (TRADOC Pam 525-5 1994). However, if decisive force is necessary it is critical that logistics enhance the tempo of those decisive operations rather than dictate the tempo.

This thesis will analyze the impact of the redesign on divisional logistics and evaluate the impact on the maneuver battalions. The redesign should enhance the commander's options rather than limit them, and should also accommodate the troop leading procedures (particularly the 1/3, 2/3 rule) in order to facilitate the military decision-making process (MDMP), or battle command as it is referred to in Force XXI terms. During a battle the amount of time a commander has to properly synchronize may be limited, especially in a Force XXI environment. Every new concept and redesign must be focused on simplifying the MDMP. That is one reason why analyzing the redesign is significant. The other is to ensure that in an effort to make the Army more efficient because of constraints placed by Congress and the desire to exploit technology, effectiveness is retained or enhanced.

The significance of identifying vulnerability is obvious but there is one more reason why this study may be significant. If the analysis proves that the redesign promotes logistics effectiveness and responsiveness, then the process of coming to that conclusion should also aid in identifying centers of gravity for logistics success. Center of gravity in this case refers to those "characteristics, capabilities, or locations from which a military force derives its freedom of action"

(FM 101-5-1, 24). Identifying these centers of gravity can significantly help leaders focus on priorities during the synchronization process. Any analysis that can simplify or help commanders prioritize during the MDMP will enhance command and control and therefore positively contribute to the battle.

CHAPTER 2

LITERARY REVIEW

The vision of Force XXI is in an experimental stage and doctrine is being formulated in the field as this paper is being developed. The only real doctrine to date for the division redesign is based in TRADOC series 525 publications. The new FM 100-5 (Operations) is in draft form and should be released in calendar year 1999. As a result the majority of research came from three main sources.

The first was lessons learned from recent or current warfighter simulations conducted by the battle command training center (BCTP) at Fort Leavenworth. The second was insight gained from recent Army Warfighting Experiments (AWE). The third was development concepts from analytical centers such as those run by TRADOC, specifically TRAC-Lee. Many of the issues have been discussed in professional periodicals and those opinions and discussions will be included in this thesis. As would be expected many command briefs and in process reviews (IPRs) have been put together on this topic and are available on the Internet. Also available on the Internet are the vision statements for Force XXI topics. Design analysis reports and news briefings also add perspective.

In addition to actual physical resources available are the actual personnel themselves. The proponent for Force XXI is TRADOC and the proponent for the CSS portion of Force XXI is CASCOM. There are also the officers in the experimental division itself and those who run the AWEs. All these people

become valuable resources and interviews could lead to a dimension not available in published materials.

The intent of the literature review is to present the literature in a manner that provides the reader some insight into the suitability and quality of the literature used. The author prioritized literature as it pertained to this thesis. There is also a discussion of any pertinent literature that was eliminated by the author if there was a compelling reason for doing so. This chapter is critical to the context of the thesis and will validate it in such a way as to establish if proper review of literature preceded the conclusions of this thesis.

The basis for this entire thesis is the acceptance of the future threat as it is described in TRADOC PAM series 525. Since TRADOC is the proponent of Force XXI one would assume that the resources were allocated primarily to TRADOC in researching the threat assessment. Therefore, the author relied heavily on TRADOC's interpretation of the future environment. In conjunction with TRADOC's analysis there is another key source on land warfare written by General Gordon Sullivan and Lieutenant Colonel James Dubik titled *Land Warfare in the 21st Century*. Since General Sullivan became the Chief of Staff of the Army and is credited for inspiring the Force XXI concept it is the book that describes best his views of the future environment and is most likely the basis for the Force XXI concept. The author considers these two sources as critical to the foundation of the thesis.

Important to CSS issues is the *Force XXI Division Concept for Combat Service Operations* dated 15 May 1998 and produced by CASCOM. CASCOM is the proponent for all CSS issues involving Force XXI as tasked by TRADOC. Therefore, it is this document that lays out the framework from which the DISCOM is restructured to support the redesign. It is this concept that will primarily be analyzed and evaluated.

There are multiple articles and papers written on the topic as well as other theses. These will all be reviewed for the reader so they may be considered for further research and future works. In addition, the author reviewed the after action reviews from various experiments and exercises to help the reader distinguish which experiments or exercises most provide insight into the logistical concerns of Force XXI. In many simulations logistics is not incorporated totally and may lead to tainted results. If that is identified then it will be presented here in the literature review as part of a resource analysis.

Interviews will add an insight that might not have been noted in other resources. Any key personnel who lent ideas to the paper will be mentioned in this chapter to identify those key positions that will have access to information for future study. All attempts were made to properly prioritize the usefulness of resources used.

To ensure that the analysis is balanced the author has reviewed both logistics and combat arms theses on Force XXI and reviewed the resources used in those studies to ensure all views are considered. At no time did the

author pick up the views of another author without review of their resources and documentation of their ideas. The intent is a well-documented and balanced research effort.

The very nature of the Force XXI environment dictates a very fluid doctrine. In the early stages of doctrine development many changes are made and as experiments are conducted characteristics identified. The author found it difficult to focus on one set of characteristics due to the conflicting nature of the papers and publications reviewed. Therefore, the author tried to include the predominate thoughts of each of the influences to provide the reader the flexibility to keep open minds and not box in the doctrine. The author used the technological developments as described by the Army Division XXI pamphlet published by DOD to set the stage for the impending doctrinal structures. Also described in this pamphlet are the key battlefield dynamics that form the framework in which the digitized division will fight. This is a key source for structural and operational considerations for the new division.

A TRADOC document titled *Land Combat in the 21st Century* from the TRADOC website was very useful in learning the history and intent of the Army warfighting experiments. The characteristics and patterns of operations for the twenty-first century are discussed in this document and does not exactly match the aforementioned document but is very similar to it. The author tried to include all the concepts from both documents to provide the reader a balanced picture of

the operating environment. This was a very helpful source for background information and illustrates the fluid nature of the new doctrine.

Of all the periodicals two stand out as the most helpful for this topic. The first is *The Logistician* and the second is Armor Magazine. The author also found general articles in *Military Review* which provided concise overviews of the Force XXI issues or concerns. *The Logistician* had at least twenty articles in the last three years, which were pertinent and well written. Most of the authors were in positions that would allow them to have an informed opinion on the subject. Many were concept developers or project managers for components of the design. This is helpful because it provides not only the background but the intent for many area revolving around the actual design. Armor magazine was similar in its approach. The most useful perspective was that of the maneuver officers and their view of the future environment and their considerations for the design. This added a tactical perspective that was necessary for this study.

One source that was quite useful and came to the author very late was the public affairs official response to Force XXI concerns. This addressed many of the concerns already identified by the author and provided the Army response, which was incorporated for the readers' consideration. In many cases the Army response was not sufficient and identified in the study.

Although there are several theses on the same topic the author did not use them because the author did agree with the assumptions or found the paper to be biased. In many cases the theses were not focused to the tactical level

being considered for this study. Therefore none were used as a source but they are available to the reader for further consideration at the Fort Leavenworth library.

The best source of information came directly from CASCOM and TRADOC proponent offices by way of briefings and slides. Several slides included in chapter four came directly from CASCOM. These provided insights not found in periodicals and often had good summaries of lessons learned. The only problem in using slides is that its is very hard to validate the credibility of the information being provided. The author made a decision to use only briefings that were available on the proponent's homepage or briefings that represented the organizations that put it together and were widely disseminated across the Army staff. In addition the author worked very closely with the author of the CSS concept put our by TRADOC to insure that the intent of the concept was properly described in this study. MAJ Frank Schneck was invaluable in providing logistics insights for the new digitized design and CSS concept.

Discussions with the Quartermaster General, Major General James Wright, and TRADOC Commander, General John Abrams were helpful in validating the intent of the doctrine. A VTC with the DISCOM commander of the 4th Infantry Division also provided invaluable insight into the specific logistics considerations for the extended battlespace of the new division. All in all, the sources used represent a balanced look at the new design from both a logistics

and tactical perspective and lend credibility to the study of the new digitized division.

CHAPTER THREE

METHODOLOGY

The purpose of this study is to analyze Force XXI concepts and validate the CSS concept for support in future warfare. Based on the scope of this thesis only divisional logistics were evaluated; however, there is potential for there to be implications that will affect the overarching concepts of support for Force XXI. This thesis is based on an analytical methodology in researching this topic. The intent of the thesis is to keep a balanced approach and consider both warfighter and logistical concepts. The process involves three steps. The first is to discuss the structure of the redesign in detail to lay the foundation for all future analysis. The second step is an analysis of the new design using results from warfighting experiments. The third step is the evaluation of the analysis using established criteria discussed later in this chapter. The content of this thesis will be broken into seven chapters to facilitate this analytical methodology.

Chapter 1

In chapter one the introduction served as a tool to paint the environment from which this thesis will be working. A discussion of the background leading up to the current division design was presented purely for informational reasons. An illustration of the threat environment was included in this chapter. This illustration is the essence of the introduction because the reader must agree to that threat environment if the rest of the analysis is to have credibility. Also important in this chapter is the discussion of follow-on questions that stem from the research

question. This becomes important in chapter six when these questions form the basis of the criteria established in order to evaluate the analysis.

Chapter 2

In chapter two a description of the literature used for this thesis is presented. It becomes important for the reader to establish in his or her own mind if the literature is balanced and thorough to facilitate the credibility of the thesis as a whole. It is the author's mission to present the literature in a manner that provides the reader some insight into the validity, strength, and quality of the literature used in order to provide recommended literature for future or similar works. This chapter is an honest review of literature the author investigated. If certain literature was used sparingly for a particular reason it is so stated and literature that was deliberately eliminated will be identified and explained. This chapter is critical to the context of the thesis and a prudent reader will want to evaluate if the thesis is set in a context that is suitable.

Chapter 4

This chapter will begin by using published doctrine to lay out the foundations of the new design. The intricacies of the design will be presented in detail and any logistical enablers outside the division that directly enhance division operations will be identified and discussed as well. It is during this chapter that the patterns of Force XXI will be identified and expounded upon. The most important pattern will be the sustain pattern presented in TRADOC PAM series 525 but other BOS patterns will be investigated to ensure all impending logistics matters are addressed. To ensure all matters that should be

included in the analysis are presented the author had this chapter reviewed by Force XXI experts in the logistics community and combat arms community residing at Fort Leavenworth. Once the foundation had been validated for correctness, analysis of it was imminent.

Chapter 5

The analysis was conducted analytically by defining the problem first. Then using the results of warfighting experiments and interviews with key staff members in the 1st Brigade a series of critical issues were identified. The author identified both strengths and weaknesses of the design based on the resources mentioned and doctrine. The important part of this chapter is the presentation of critical issues. The issues are presented in such a manner that all may be evaluated equally and with the same methodology.

Chapter 6

Based on the supporting questions described in chapter one three areas of importance for the maneuver commander became evident. These three key ingredients of warfare success are tempo, flexibility, and force protection. If logistics for the new design can facilitate these three areas then it will have been effective. For that reason, these will be the criteria for which the author will evaluate the analysis presented in chapter five. In selecting criteria the author compared the Force XXI concepts of survivability, lethality, and tempo to the sustainment imperatives of anticipation, integration, continuity, responsiveness, and improvisation. Each set above supports either combat operations or logistical operations. From these the author derived a corps set of criteria that

addressed both combat and logistical needs and used them in evaluating the new design.

Chapter 7

Conclusions are a natural follow on to analysis and evaluation. In this chapter all conclusions are presented and recommendations made. Further research will be addressed as well. If the author was successful in the previous chapters the reader will find the conclusions represent a thorough analysis of this topic and could be used to validate the new division redesign.

Overall, this thesis proposes to evaluate the logistical effectiveness of the new division and present the analysis and conclusions in a thesis of substance that can be used to make future force structure and concept decisions. The significance of this kind of analysis should be evident. Without effective logistics the future battle will be lost no matter how good the combat force. There are times when constraints placed on the military dictate force structure. This can be dangerous and at times hard to see in the day-to-day activities of running the Army. However, it is important to evaluate warfare without considering constraints from time to time to ensure all warfare needs are considered. Sometimes constraints force decisions that are geared toward efficiency and never address the effectiveness of the military. War is risky enough without incurring more risk because of constraints that might need to be reevaluated at the highest levels themselves. It is the author's hope that this thesis will help in identifying any issues that may cause a maneuver commander to accept unnecessary risk and therefore lose his flexibility in the battle.

CHAPTER 4

DIVISION DESIGN

The restructuring of the Division Support Command was essential to the Force XXI concept. In the past (AOE) all battalion level logistics functions were performed by the support platoon in the headquarters of the maneuver battalion. With the redesigned division this habitual support was moved to the forward support battalion (minus medical) so logistics could be completely controlled by logistics officers in the division. Whether or not this provides more flexibility to the maneuver battalion commander is discussed in future chapters. To illustrate the logistic design for the new division it is important to begin with the Force XXI framework. The framework is taken from TRADOC Pamphlet 525-5, *Force XXI Operations.*

The author presents the Force XXI framework by illustrating the factors that affect the framework first (dynamics) and follow with the operational considerations (patterns) and finally the tactical level impact (new support structure). Based on the five technological developments mentioned in chapter one TRADOC built a framework in which the new division would operate to maximize these developments. (TRADOC Pam 525-5 1994,3-6) The framework for Force XXI is based on key battle dynamics that have been identified as essential, based on future threats and enhanced technology. The first of these is battle command. Battle command is the leadership dimension of operations and is based on the intuitive direction of leaders due to their study and experience.

The way in which information is gained and processed will change the way in which commanders maintain command and control. Leaders of the future will require greater situational awareness and the systems will be designed for command on the move. With the enhancements in battle command came an extended battle space and is the second battlefield dynamic.

Battle space expands past the traditional boundaries on the battlefield and includes the area of interest. It is an area, which is defined by the maximum capabilities of the unit to influence the battle. Information operations will provide more space to commanders through visualization and by denying the enemy's ability to see. It opens up boundaries to include joint operations. Closely linked to this is consideration of the use of depth and simultaneous attack.

Depth and simultaneous attack is another dynamic of Force XXI. To capitalize on the new battlespace and precision technology it becomes important to dominate the entire width, height, and depth of the battlespace with rapid deep operations combined with short-range precision weapons to get inside of the enemy's decision cycle. There is also the ability to synchronize joint efforts toward this result. An enhanced digital network will facilitate these various attack methods.

The fourth dynamic is early entry. The credibility of the force and country as a whole rely on maintaining control throughout the entry process. The aim will be simultaneous application of the joint force. Modernized sea and air assets will accommodate success in this area. Prepositioned ships will enhance the framework of force projection. The early entry force must be prepared for either

a permissive or non-permissive entry with the intelligence, support, and combat power to do that.

The last dynamic is combat service support. Logistics for Force XXI must be "versatile, deployable and expandable" (TRADOC PAM 525-5 1994, 3-13). To support the other battlefield dynamics it must be modular and easy to tailor rapidly for both active and reserve component units. It must also have the capability to support joint operations and incorporate joint enablers. Civilians (contractors) will also play a key role in maintaining Force XXI and must be integrated into the system to provide seamless logistics. At the operational level primary focus will be on reception, discharge, onward movement, positioning of facilities, and movement control. It will be necessary to have prearranged host nation support agreements as well. At the tactical level, focus will remain on manning, arming, fueling, fixing, moving, and sustaining soldiers and equipment. Logisticians will have to rely on new technology to increase asset visibility in order to better anticipate the needs of the force.

The five battlefield dynamics discussed will comprise the effort of Force XXI forces and will be the dynamics on which future operations will be built. Operations in the future will have clear patterns, emphasize tempo, and be joint and multinational in nature. The battlefield dynamics will be the framework that will allow the Army to address these patterns. Patterns of operations will serve to focus the tasks of the force. These patterns will not necessarily be sequential and include the following (Kirin, 1995, 12):

1. Project the force

2. Protect the force
3. Gain information dominance
4. Shape the battlespace
5. Decisive operations
6. Sustain the force

There are a number of concepts, enablers, and technologies to support the last pattern of sustaining the force. Included in this last pattern are the six integrated concepts of support mentioned in chapter one. They include: anticipatory logistics and personnel support, split-based operations, sustained tempo, enhanced throughput operations, velocity management, and battlefield distribution. These are all important to support the distribution-based logistics concept which is the heart of the new logistics structure.

A number of enablers are important to the success of the six integrated CSS concepts. The enablers include: integrated maneuver and combat service support systems command and control, total asset visibility, modular organization, movement tracking system, and wireless management information systems. To support these are the following technologies: information age technologies for inventory control, more durable materials, over-the-air software diagnostics and repair, and automated cross-leveling and rerouting (Army Vision 2010, 16). The framework for the redesigned division was built based on the threat, environment, and technologies. In some regards the success of the redesign depends on the assumption that the context described will actually be in place. This is not the case today as all of the enablers are not yet in place so

only portions could be incorporated into the tests of the concept. Consequently, this study is one of theory.

It becomes important now to show the transition from the old division to the new in order to analyze the differences. The author uses graphics that have been created by CASCOM to depict several of these changes. The DISCOM was designed to enhance its ability to sustain the division by giving it an increased ability to do the six integrated support concepts. Figure 1 shows the new division design being considered for this study. This may not represent the division as it is shown in the *Army Times* from time to time or the final force structure, but it is the concept that General Dennis Reimer (CSA) approved. There have been continual adjusts made, but for the most part it is quite representative of the force that is part of the experimentation at Fort Hood, Texas.

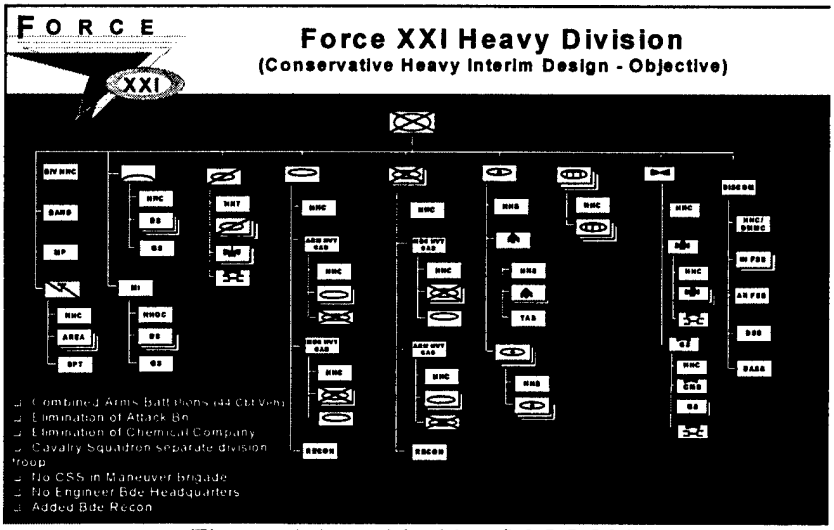

Figure 1 (provided by CASCOM)

The author focuses entirely on the CSS changes that are captured in the redesign of the DISCOM. The CSS concept depicts certain considerations such as consolidated CSS. The intent was for DISCOM to control the battlefield operating system. However, medical was left unchanged as was support to the cavalry, the only unit to retain its support platoon. In structuring the new DISCOM many considerations were included. The most significant was a change from the functional companies (supply, maintenance, and medical) in the forward support battalions (FSB) to multifunctional companies. There was also an effort to reduce the logistics footprint by consolidating authorized stockage lists (ASL) in one warehouse for all classes of supply and dispersing the multifunctional companies on the battlefield. New logistics enablers provide greater visibility, which facilitated the decisions that were included in the design as well. The enablers also allowed for anticipatory support and increased mobility, which were incorporated into the DISCOM. Most enhancing to the design is the new velocity based distribution system, which reduces the need for a supply-based design. As a result, distribution management was centralized in the support operations office and included in all levels of logistics. These considerations in the development of the support structure allowed for the intent of the six integrated concepts to be incorporated into the redesign.

Restructuring of support began with the DISCOM headquarters. The support operations office (the DISCOM's primary activity for planning) was

reorganized to consolidate staff efforts for logistics support and the movement control and material management functions were added to the support operations office. Additionally, a distribution office was added to provide management of the distribution pipeline for all classes of supply. Figures 2 and 3 depict the new DISCOM structure as well as the DISCOM headquarters. This will enable logistics to be more dispersed at the lowest levels. The main support battalion (MSB) becomes the division support battalion (DSB) with the real difference being the ability for reinforcing support. The DSB will only have the capability of reinforcing support for a half day of fuel support. There is no reinforcing capability for the other classes of supply.

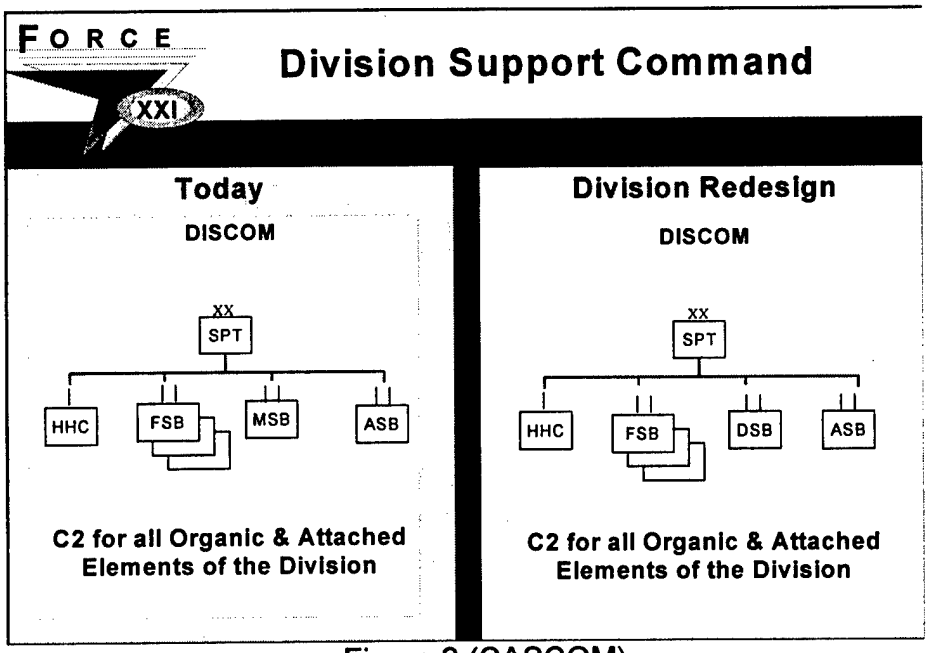

Figure 2 (CASCOM)

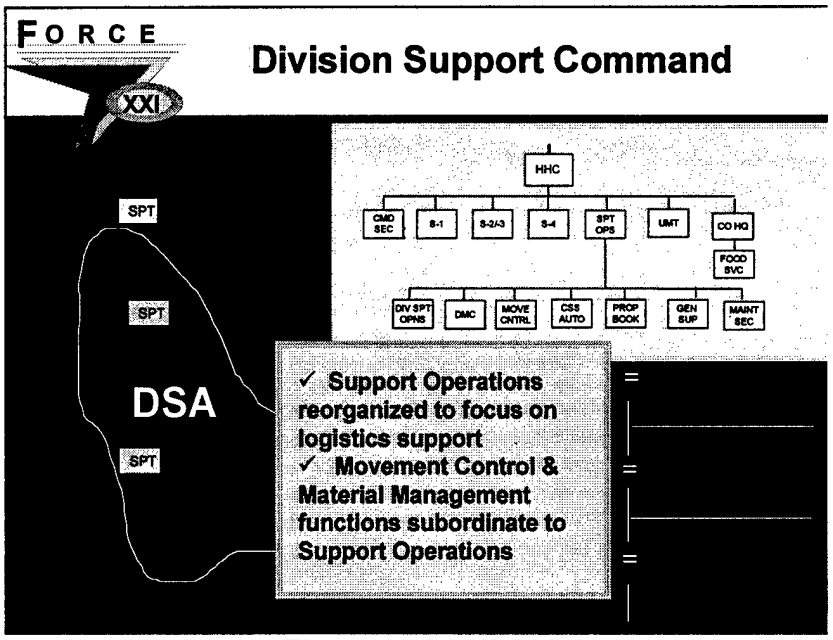

Figure 3 (CASCOM)

The mission of the DSB is to support the division troops. Other changes to the structure from the MSB are a consolidated SSA, no water purification assets but some distribution assets, 1 day of operational requirements for division troops, and no backup to the FSB except the limited fuel mentioned. It remains in the division support area (DSA) where the MSB was located. The division aviation support battalion (DASB) could also be located in the DSA and has only limited changes. The changes that do exist are consistent with and complement the DSB changes. They include consolidated SSA, increased fuel distribution capability, and the ability to maintain one day of operational requirements for the cavalry squadron and aviation brigade.

The most significant changes are in the structure of the forward support battalion (FSB). Figure 4 graphically shows the difference in the old and new FSB.

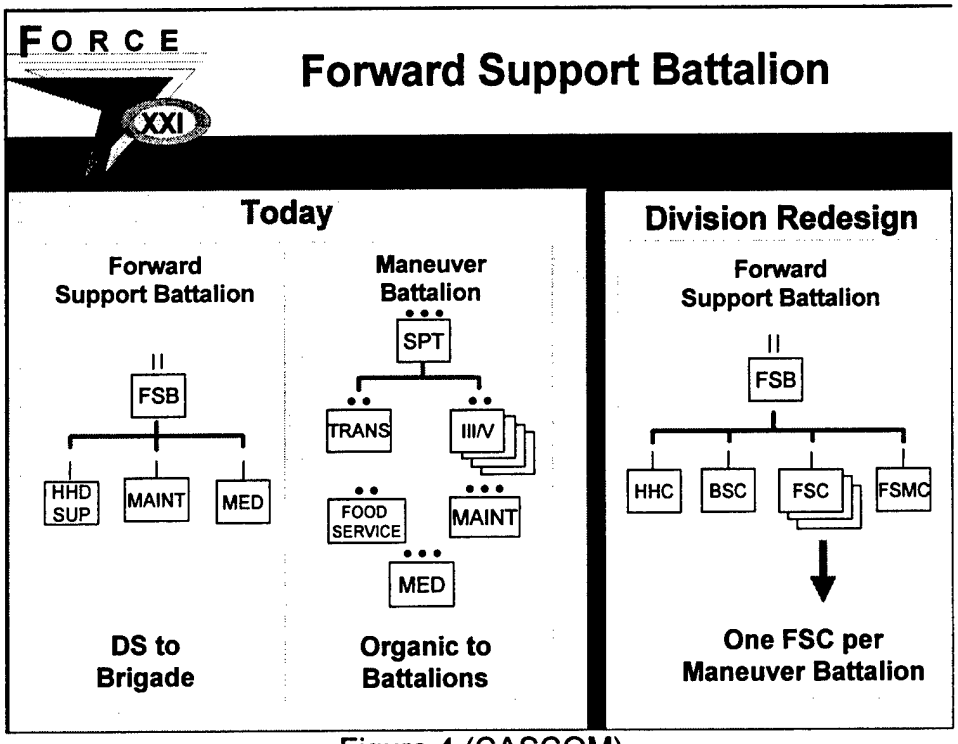

Figure 4 (CASCOM)

In the past the maneuver battalions had a support platoon organic to the headquarters company of the battalion. The support platoon was supported by the FSB, which was three functional companies (supply, maintenance, and medical). The support platoon would come back to get supplies from what was

called the field trains. The field trains, when collocated with the FSB, made up the brigade support area. Each battalion had a field train that would protect the BSA and push supplies forward to the company combat trains. Force protection of the BSA was the responsibility of the field trains.

In the new FSB the support platoons are given to the FSB and the whole FSB is restructured into three forward support companies (FSC) and a base support company (BSC). The FSCs are multifunctional and are dedicated to support a certain battalion but are under the command and control of the FSB commander. The FSC locates in the battalion rear area while the BSC and the FSB headquarters remain in the BSA. This reduces the size of the logistics footprint at any one location but increases the number of footprints on the battlefield. It is a dispersed approach. The FSB is responsible for medical support to the combined arms team and forward surgical teams are attached from corps. So, what is now in the FSB are multifunctional companies and a consolidated SSA (BSC). It is distribution focused and contains an engineer support platoon. Organizational and direct support (DS) maintenance will be provided habitually through the FSCs. Food service is provided to the maneuver battalions by their supporting FSCs, The BSC in the BSA provides food service support to brigade HHCs and brigade reconnaissance troops.

In reviewing the research question real attention must be given to the FSC. This is the support structure that a battalion task force commander has in battle. The area where the FSC supports from (battalion rear area) is called the task force support area (TFSA). From this location the FSC will send forward

teams of support as necessary. Linkup at logistical release points (LRP) for resupply is common and in most cases will be throughput from corps. The concept for the FSC increases CSS capabilities forward and maximum throughput of supplies (battlefield distribution) along with combined organizational and direct support (DS) maintenance. The combat commander sets the priorities while the CSS commander employs CSS assets and manages CSS systems. There is a support operations section in the FSC that will coordinate all systems and throughput. The structure of the FSC is shown in figure 5.

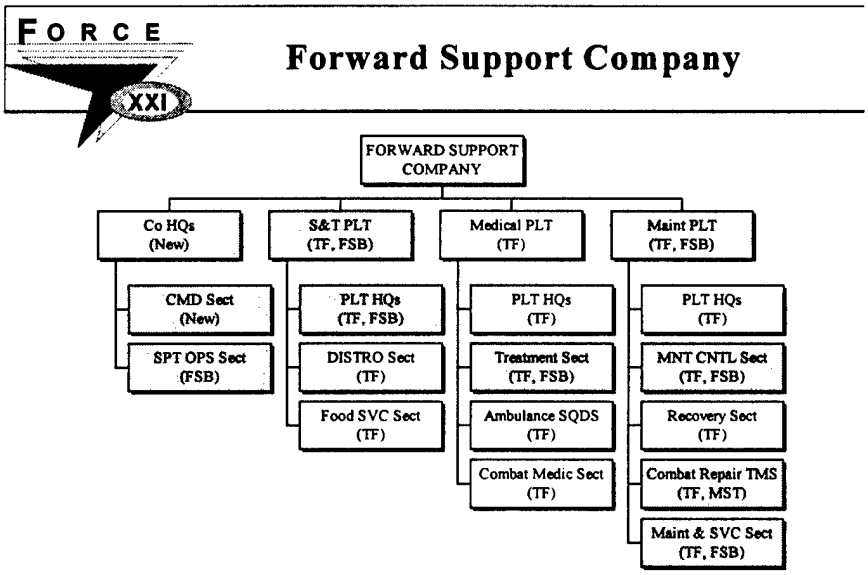

Figure 5 (CASCOM)

Most operations at this level will be conducted by logpacks (convoys of more than one class of supply, tailored for a particular unit). Logpacks from the BSC and corps will assemble in the TFSA or LRP. Food specialists in the TFSA will prepare rations. Unit supply sergeants will assist in preparing, staging, and verifying company logpacks. The supply and transport platoon leader will link up with company first sergeants. Company first sergeants lead company packages to the company area. The first sergeant returns any packages within two hours and the platoon leader returns to the TFSA for replenishment. The FSC support operations office will coordinate the synchronization.

For medical support a third treatment team was added to the FSC. The company medic facilitates and coordinates the evacuation. The FSC can simultaneously operate three treatment team locations up to twenty-four hours. A forward surgical team will augment the FSB for echelon II capability. Again, the support operations office coordinates the synchronization and use of ambulance exchange points.

Maintenance and recovery operations maximize split-based operations through the use of CRTs (combat repair team). The CRT moves forward to do battle damage and repair (BDAR). If additional maintenance is necessary the equipment is pulled back to the rear of the company. If additional maintenance is still required it is removed by recovery assets from the TFSA and pulled back to the maintenance collection point (MCP), which is located in the TFSA. Anything that can not be fixed in eight hours is evacuated to the rear of the battlefield.

Important to the concept is the footprint on the battlefield. To better depict this charts six and seven will illustrate the key distances. From a tactical point of view the location of the FSC is similar to where combat trains are in the AOE. The actual support capability is actually increased when looked at from that point of view. The difference is the command and control of logistics. "By having all CSS under the control of FSC, the barrier between unit supply and DS supply is broken" (Aldana et al.2). The FSC is a composite and multifunctional unit, which is modular in nature. It provides for distributed management of logistics on the battlefield (Link, 1996).

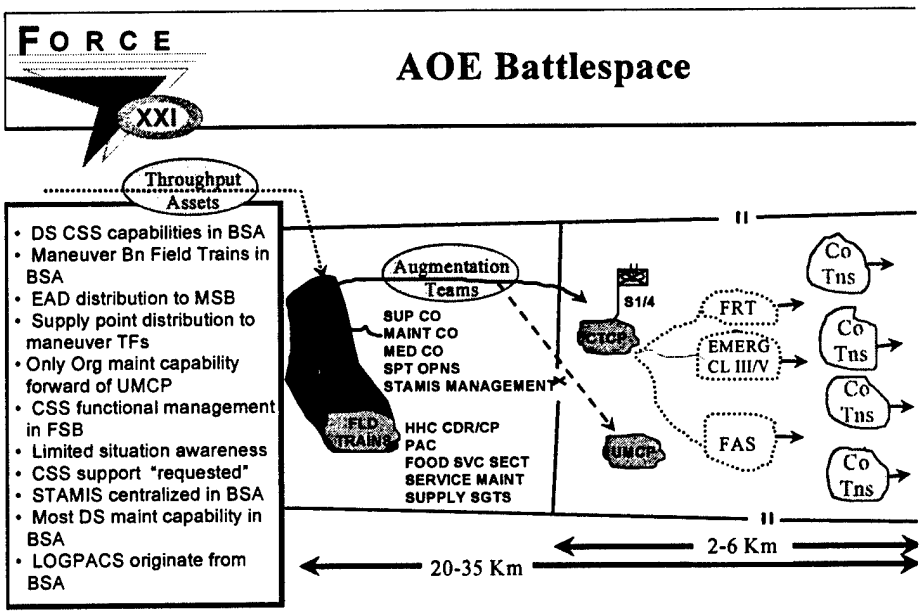

Figure 5 (CASCOM)

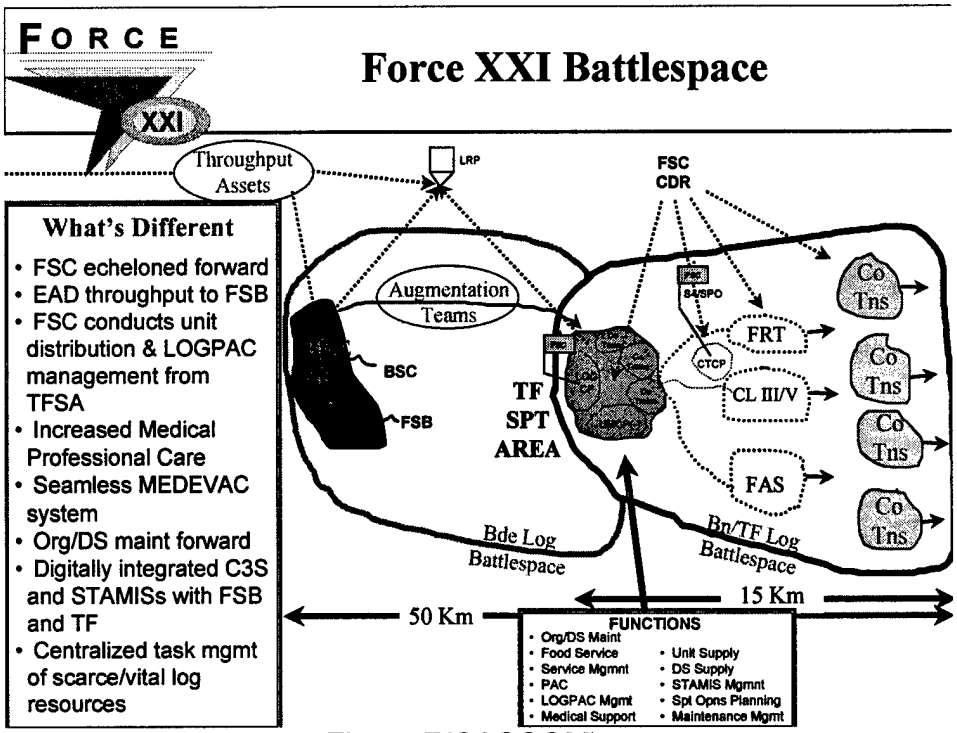

Figure 7(CASCOM)

At the tactical level it is the military units organic to the division that provide direct support to the maneuver commanders. They provide coordinated and tailored support as in the past. The difference is that all logistics in the division now comes under the command and control of the DISCOM and it is more multifunctional and dispersed. The DISCOM redesign incorporates the six integrated sustainment concepts to meet the challenges of the sustainment pattern for future operations. This pattern is couched in the combat service support battlefield dynamic as part of the Force XXI framework in response to the developments in technology and future threat. In the next chapter the author

reviews the experiments and tests that have been conducted on the new division to better analyze the impacts of the new structure.

CHAPTER 5

EXPERIMENT RESULTS

The division XXI advanced warfighting experiment (AWE) that was conducted in March of 1997 at the National Training Center (NTC) was the culminating AWE to validate the Force XXI design. Although in the logistics field all the enablers were not in place to properly exercise the CSS aspect of the experiment there were some lessons learned that can be used in consideration of the CSS concept. "The study proponent for the division AWE is TRADOC with the experimental force (EXFORCE) coordination cell (ECC) as the executive agent" (Kirin 1996, 1). Up until March1997 there had been experiments starting at the platoon level and going up to the brigade level. In 1994 there was an exercise called Desert Hammer at the NTC which involved a battalion sized combined arms team. The outcome was less than expected. It was not until the AWE in 1997 that CSS was integrated, and it is this exercise that is the basis for most of the data collected on this topic.

In reviewing the AWE results the author provides the operational guidance from the CSA in order to understand the intent of the AWE. Both the maneuver and logistics results were reviewed at the tactical level. Prior to the AWE the TRADOC commander issued general guidance on the conduct of the experiment. First, it was important to him that the simulations be constructive. He also wanted it to be a warfighter exercise, which meant all tactical command and control procedures were used. In addition it needed to be a joint operation

and done in time to impact the next program operating memorandum (POM).(Kirin 1996, 3)

It was decided that the CSS concept designed to support the new division would be fully incorporated. Although logistics enablers were not in place to facilitate proper execution of the CSS concept, the structure was exercised using the new highly dispersed FSCs. The design was focused on effectiveness, responsiveness, utility, and supportability. In addition to the general guidance from the CSA the design adhered to the following guidelines:

1. Operates as part of a joint task force (JTF)
2. Operates as part of a corps
3. Capable of full-dimension operations
4. Capable of decisive operations
5. Still tailored to METT-T
6. Mix of heavy and light forces
7. Designed as a heavy division

In addition the design followed the principles listed:

1. Organize around information
2. Dominate battlespace: speed. Space, and time
3. Control the tempo with overwhelming lethality and survivability
4. Mount, execute, and recover from operations simultaneously
5. Capable of quick, decisive victory with minimal casualties
6. Rapidly deployable and operationally agile (Army Division XXI, 7)

The primary focus became the maneuver battalions' ability to operate tactically with the enhanced command and control equipment. So, it is appropriate to begin by looking at the success of the maneuver battalions and then evaluate the capability of the FSCs to support them.

The intent of the 1997 AWE was to determine if information dominance and enhanced capabilities would increase lethality, survivability, sustainability, and tempo across the force. The simulation was initially conducted at Fort Hood's simulation center before going to NTC. Leaders felt that the new systems would be able to impact the fog of war. The results were more successful than those of previous exercises. It became clear early on that there was less reliance on seeing the enemy before engaging him. "The ability to engage in greater depth also resulted in increased survivability of the attacking forces" (Hutto 1998, 2).

Another goal of the AWE was spiral development. Spiral development brings together all parties from the user to the developer and even includes industry. This reduces the amount of time to modernize and is based on immediate soldier feedback making the systems user friendly. (TRADOC Press Release, 24) What the exercise facilitated was a soldier on the ground providing instant feedback to contractors and the ability to upgrade the system along the way. This was a new concept for weapon development and acquisition.

Extended Battlespace

One part of doctrine that drastically changed was the size of the battlespace the division would cover. "The premise from the onset was to expand the width and depth of the division area of operation. That was largely successful since commanders had the ability--through near real time situational awareness--to concentrate forces rapidly where the enemy was" (Hutto 1998, 4). Quickly the new size of the battlespace impacted the enemy's approach toward the new brigade. The enemy focused on the high payoff targets such as artillery and target acquisition units. This proved to be a challenge for the digitized brigade as it did not have the combat power to properly protect these assets. The enemy also focused on the gaps between forces. With an expanded battlefield it is harder to mass forces. Aviation and multiple launch rocket systems (MLRS) were able to keep the enemy off balance. The idea of interlocking fires and mutually supporting units is no longer as important. With the commander's ability to see the battlefield it is not necessary to use troops to watch areas that are inactive. (TRADOC Press Release, 42)

The ability to use aviation and MLRS deeper, due to long-range munitions, helped to better shape the battlefield. During the simulation commanders were able to see enemy and friendly units and get inside the enemy's decision cycle. This allowed commanders to use long-range weapons and smart munitions to devastate the enemy. Instead of massing troops the commander could mass weapons and achieve the same effect. (Hutto 1998, 6) Conducting battles deeper became a deciding factor in the favorable outcome of the battle.

Use of reserve operations became less important when information dominance was in place. A ground reserve could not cover the area fast enough anyway to affect the battle in the new battlespace. The division found that it was more beneficial to use reinforcing brigades and orchestrate the deep fight. Early detection of the enemy is critical toward this goal. One scenario that had not been tested was the ability of the enemy to fight in urban areas and the impact on new tactics for the digitized division. This could impact early detection and the ability of friendly forces to use technology to maintain the initiative. It did not produce results to validate the effectiveness of a reinforcing brigade in an urban environment.

Situational Awareness

A success in the digitization arena was the use of the main planning and staff system called the maneuver control system (MCS). This system allows the commander to see both friendly and enemy units and receives data from supporting systems such as the combat service support control system (CSSCS). This linkup provides the combat power capability in logistical terms. MCS reduces the staff's planning time significantly by updating overlays on an hourly base. Because every unit has MCS the overlays are digitally disseminated throughout the division. The system also has tactical email for instant messaging between commands. Operations orders are also developed on MCS and reduce the need to hand-carry hard copies to each subordinate unit. Annexes to the operations orders can be electronically filed as well.

There was some debate about the new division's ability to sustain tempo. The division is about 25 percent lighter than the AOE. The maneuver battalions have three companies compared to four in the AOE. Adding the new size of the battlespace, tempo could be compromised. In a close fight the new battalions only have fourteen weapons systems and may take longer to move through the enemy. The bypass criteria (size of the enemy unit that will be passed) may be increased to accommodate for this; however, this could become a threat to the rear area. In the deep fight the ability of the Crusader (improved long range howitzer) to use smart munitions and it's ability to be more autonomous allowed it to cover a broader space. For the 1997 AWE the capability of the Crusader was simulated. This significantly enhanced lethality and survivability.(Hutto 1998, 13)

Command and Control

Closely associated with the tempo is the ability of the tactical operating center (TOC) to jump. This was never exercised and could have devastating effects on tempo and command and control. Much of this was due to the prototype equipment. Due to that, it was deemed counterproductive to exercise this procedure. This was a goal of the 1999 AWE. The division as a whole was also logistically reconstituted four times but this was due to the amount of battles that leaders wanted to execute in a short amount of time to properly stress the division. The division also beat four combined armies in that time. (TRADOC Press Release, 47) Command posts have not grown but they have been reorganized as a result of past AWEs. For example, the division engineer and signal staffs have consolidated positions in the division headquarters. The rear

command post was eliminated with much of its functions consolidated in the main command post. The impact on the DISCOM was minimal as the functions were still conducted by the assistant division commander for supply (ADCS) who retained visibility of the rear area through technology.

Engineer Support

Another significant change to the division structure was the removal of the engineer brigade headquarters. Restructuring the support for the engineers facilitated this. The engineer support platoon in the BSC of the DISCOM is now in direct support to engineer units within a brigade. This was not fully evaluated; although, the commanding general of 4ID, Major General William S. Wallace, did express concern with the new structure. It provides flexibility at the brigade level but less at the division level. Also, there was concern that the engineers must coordinate with non-digital units for backup support (corps units). This concern could also apply to CSS.

Automation

In the digitized division it could be said that automation will become the center of gravity in a tactical scenario. With this in mind, the enemy's ability to use jamming and hacking could lead to early culmination for friendly forces. Although this was exercised to some degree too many of the systems were being simulated to get a good picture as to the actual vulnerability. In the CSS arena both CSSCS and the Force XXI battle command brigade and below (FBCB2) were simulated at least in part. In future exercises this will be played more and system firewalls will continue to grow to protect automation.

Overall the experiment was considered a success. The ability of the battalions to operate was validated. However, it was noted that although digitization significantly enhances situational awareness, it is still the soldier or leader who must incorporate the information in a manner that provides some use to the commander. (21, p.1) One challenge that the battalions endured prior to the exercise was evolving systems and upgrades, something that will be a constant state of affairs for future operations. This is a challenge at every level and interface issues between corps and the division might be future problems as well. It should be noted that it took one week at NTC to check all systems before starting the exercise. Obviously that is not something the Army will always have the luxury of conducting.

One definite outcome was a need for a digital leader's reaction course (DLRC) for all branches. Leaders are now receiving more information than ever and the speed in which the battle momentum is sustained is such that leaders will need to make decisions quickly. This is an area that will require extensive training in the future. Soldiers and leaders will be required to take on different roles. All will have to have an understanding of automation limitations and capabilities. Leaders will be required to plan and execute at the same time. There is the potential for information overload. On the other hand, there is an improved ability to send and receive orders.

Most of the equipment used during this experiment was a prototype of one sort or another and that added some frustration in the early stages. That will not be as much of an issue in future exercises. Using the spiral development

process, systems will be upgraded quickly. However, in the interim it is hard to evaluate leaders and soldiers in an environment where all the equipment is new. Most of the human considerations will have to be extracted from the 1999 AWE after soldiers and leaders have had more training and experience with the systems.

Reserve Component

There is a change to the division design that should be addressed and that is the use of reserve soldiers in the organic structure of the new division. The reserve soldiers who are to be part of the division design will all be in the same reserve unit and on mobilization will come under the division structure. Reserve soldiers will primarily be used in the rear area, brigade staff augmentation, two aviation companies, and as additional medics for the DISCOM. Although this was not exercised there are concerns that include the need for a presidential call up to plug in the soldiers. (TRADOC Press release, 30) Usually, the division is enroute to an area of operations well before a call-up. This could cause some shortfalls in the structure. It significantly impacts CSS because rear area security and medics impact two of three reserve missions.

Another area that has not been experimented with much is the integration with joint forces and allies in a digital environment. This area is being addressed and the joint piece is starting to be played more regularly with the focus on interoperability. The issue with allied forces is being addressed in committees but will not be experimented with immediately. (TRADOC Press release, 41) The army now incorporates civilian employees and contractors more than ever.

This includes host nation support. The CSS concept now includes civilian support for a full range of logistics and construction functions. These players have yet to be incorporated into the full AWE but should be exercised in the 1999 AWE.

Multifunctional Companies and dispersed Logistics

The brigade (1st brigade, 4ID) was able to control the entire battlespace. The use of the brigade reconnaissance troop (BRT) went very well, and it was only the use of the FSCs that was in question at the brigade level. Maneuver representatives felt that because the CSS enablers were not in place the FSC could not really be evaluated. "The FSC may pay off with its hypothesized benefits once all the necessary enabling initiatives are available. Any assessment of this initiative is premature" (Harmeyer 1997, 3). On the other hand an article in *Army Logistician Magazine* stated:

> The division organization was able to execute its mission without being constrained by logistics. The modularity of the units, particularly the FSC, allowed logistics leaders to move idle or uncommitted CSS assets to the right place on the battlefield, at the right time to provide maximum logistics support. (Army Logistician 1998, 2)

During the exercise logistics leaders felt that they were able to anticipate needs. This was based on information provided by the Army tactical command and control system (ATCCS) and the CSSCS. In the case of CSSCS it was only partially developed and therefore the battlefield distribution system could not be maximized. There was much concern about the expanded battlespace and immediacy of battles requiring faster resupply. (Hutto 1998, 13). Anticipation has

improved but the physical amount of time on the road is still a tangible consideration and the ability to get the supplies at the proper location faster requires not only anticipation but backwards planning to ensure the supplies are enroute before needed.

CSSCS is a database of unit personnel and equipment lists. It also provides situational awareness of critical elements, including the various supply classes and maintenance, transportation, and medical functions. "It presents a concise picture of unit requirements and support capabilities by collecting, processing, and displaying graphical information on key items" (Witt and Feigenbaum 1999, 4). CSSCS also provides a course of action analysis application to help leaders make support decisions. This was not in place or executed during the 1997 AWE.

Although CSSCS was not fully experienced there were multiple other enhances to aide the DISCOM. The movement tracking system and driver vision enhancer were used in the transportation field. The tracking system includes a sensor on each vehicle or on at least one vehicle in the convoy that is tracked by satellite. These convoys can then be electronically tracked through the CSSCS. In the maintenance arena there were multi-capable maintainers (organizational / DS) and diagnostic / prognostic sensors. This concept involves sensors that will indicate why a piece of equipment is not working or that it is getting ready to need a service. A mechanic that can conduct either organizational or direct support maintenance monitors it. This allows that piece of equipment to receive what is necessary without moving unless it can not be fixed within a certain

amount of time. The palletized loading system was used for all classes of supply which decreased the need for material handling equipment at the FSCs. This vehicle has the handling equipment attached to it and can download supplies without extra equipment.

Rear Area Security

An important lesson learned from the AWE that may not have been addresses thoroughly in concept development was the need for increased emphasis on rear area security. This is largely due to the increased battlespace and the dispersed nature of logistics infrastructure in the new design. "Long-range reconnaissance patrols, special operations forces, and bypassed enemy troops are significant threats to supply routes and CSS assets" (Army Logistician 1998, 2). With a distribution-based CSS concept main supply routes (MSR) will be extended and greater convoy protection will be necessary. There may be a need to shift from area protection to dedicated (critical asset) protection.

The biggest threat to CSS as seen in the 1997 AWE was security. During the exercise CSS leaders combated this through several techniques. Situational awareness was achieved by using the movement tracking system (MTS) which is installed on vehicles. In this exercise this was simulated. Routes were chosen that were covered by friendly forces. CSS assets that were passing through the rear area were put under the protection of military police (MPs). A rapid reactionary force was also identified to help with this mission. Movement tracking was passed on to air defense artillery (ADA) units for convoy cover. Much of this was simulated; therefore, the results were skewed to some degree.

Distribution-based Logistics

Efficiencies developed by the civilian sector greatly reduced the need to develop systems from the bottom up. The concept of distribution-based logistics was replicated directly from civilian companies to facilitate the six CSS concepts discussed in chapters one and four. The lack of success with CSSCS prompted, logistics automation to become a priority. Velocity management became important to enhance logistics. In order to do this at the tactical level all levels would have to be restructured. The concept was from factory to foxhole and that meant the enablers would have to be designed to enhance every level of logistics in order to affect logistics at the tactical level. The impact was an enabler that required much more than the original budget allocated for and put it significantly behind other enhancers in design which is why it was not fully developed for the 1997 AWE. Several areas were identified as setting the environment for velocity logistics. The first is the use of a single distribution manager at each level. The next was the need for predictive logistics which was dependent on a common operating picture between operational and logistics data. It would be possible to minimize the logistics footprint by using modular units and reduced stockpiles to facilitate the concept design. The new structure would facilitate "bypassing many echelons of support, reduce materiel handling, and expedite delivery of supplies to the warfighting units." (Witt and Feigenbaum 1999, 20)

Another system that has been developed for the new division is the Force XXI battle command brigade and below (FBCB2). This system allows

logisticians to see the common picture. This system is on a laptop located in the battalion S-4 and feeds into CSSCS. This allows the logistician to maintain asset visibility, direct and redirect platforms, conduct traffic management, and eventually receive diagnostic sensor data. It can also be used to get stock status. Situational awareness is key to the logistician seeing the pipeline from factory to foxhole.(Witt and Feigenbaum 1999, 4)

"The key to full adoption of distribution-based logistics is a change in mindset, from managing static stockpiles to managing dynamic materiel flow" (Payne 1999, p.2). The distribution-based process starts with intensive, real-time readiness management and is required throughout the supply chain to make it work. Distribution management will be critical under the new CSS concept. Managers will be tracking, expediting, and redistributing assets at all levels of the supply system. Inventory will no longer be the act of accounting for mountains of parts along the battlefield

In the new design the emergence of a virtual inventory starts to become evident. There will not be stockpiles of supplies. The stockpiles will be at a national level. Virtual inventory is the ability to track what is needed against what is on its way. It can be called "just in time logistics" or "seamless logistics," but the result is a smaller footprint and a requirement for proper automation. This was not fully executed in the 1997 AWE but was executed in the 1999 NTC rotation. Unfortunately those AWE results were not be available for inclusion in this paper.

The other exciting new development that is affecting logistics doctrine is the incorporation of prognostics in digitized weapon systems. This ability will drive down the requirement for maintainers and materiel in the division. "The ability to predict system failures before they occur will improve repair lead-times and prevent failures during mission-critical operations." (Houck 1999, 20) Parts that diagnose themselves and requisition their own replacements or needed components will reduce the number of soldiers involved in the supply process. This is part of the new CSS concept but has not been integrated as an enabler yet. When it is integrated though it will affect logistics at the division level by reduced personnel strengths and less down time for equipment producing better readiness rates. .

The need for anticipation becomes ever so important in light of the factory to foxhole approach. The lines of communication (LOC) are much longer and therefore will take at least twenty-four hours from the factory to the user. There are authorized stockage lists (ASL) in the DISCOM to sustain the division within that period, but the numbers in the ASL are smaller. To further reduce the footprint of logistics and to synchronize logistics technology ASLs have been consolidated. This means that instead of several pipelines for distribution there will be one for all classes of supply. This will facilitate the integration of the six sustainment concepts in the following way:

> The seamless logistics system will prove to be one of the most important factors in supporting the new division. Real time situational understanding of combat requirements and logistics capabilities, and the embedded decision support systems to orchestrate those capabilities, will enable the Army to generate,

> project, and sustain the 21st century forces. By focusing on the end of the line customer needs the entire logistics system dynamically anticipates requirements before the mission is degraded and provides seamless support that will not encumber operations. (Wallace 1999, 3)

In the digitized division CSS has made significant changes. To exploit these changes for success, unity of command must be achieved through centralized distribution management. In addition, increased velocity allows bypassing levels of support, strategic and combat configured loads, and in transit visibility. Situational awareness provides a common operating picture and a surge capability. Lastly, the agile logistics structure incorporates tailored forces, split-based operations, and minimal stockpiling (TRADOC Press Release, 20) The result is a minimized footprint, maximized throughput, and anticipatory logistics. To have an adequate logistics footprint, the size, amount, and knowledge need to be balanced. "It is the result of a reduced logistics demand, more lethally efficient weapons, and information technologies that focus on the warfighter that allows for streamlining" (Houck 1999, 3). The most important aspect is the transformation from supply-based to distribution-based logistics that makes this new division so different.

In order to synthesize the results of the AWE for analysis it is important to identify what issues are at hand. The author must address the question of whether the FSC can effectively support the maneuver battalions in the digitized division. The results discussed in the current chapter will be applied to the criteria identified for effective support. In selecting criteria the author compared the Force XXI concepts of survivability, lethality, tempo, and sustainment and

converged them with the sustainment imperatives of anticipation, integration, continuity, responsiveness, and improvisation. From these the author derived a core set of criteria that will be used in the following chapter to analyze the new CSS concept for the Force XXI division.

CHAPTER 6

ANALYSIS

Will the forward support company improve logistics to the maneuver battalions in the brigades of the division? This is the central question. Having reviewed the results of experiments in chapter five it is natural to look for the benefits in the new design. In order to put the results in context it is important to decide how one will gauge its success. The author offers four criteria for evaluating the impact of the new digitized division. The criteria were picked as a result of the follow-on questions to the research question outlined in chapter one.

The subordinate questions that follow the initial research question are important to reiterate. What force protection issues arise from the restructuring? What issues exist concerning the effect of logistics restructuring on the tempo of the battle? What sort of flexibility does the new logistics design provide the maneuver battalion commander? If the answer to any of these questions limits the maneuver commander, then what changes could be made to enhance the maneuver commander's options?

In evaluating the results it is critical to consider them from more than one point of view. In this case it is important to evaluate the results from a warfighting perspective and from a support perspective. Therefore, the author considered tenets from each that would help identify critical considerations for the success of the division. Force XXI doctrine has many contributing factors, but the ones that stand out as supporting the tactical level missions are: lethality, tempo,

survivability, and sustainment. Due to the scope of this study the author will not address whether the redesign of the combat structure meets those ends. Instead, the focus is on the supportability of the design to meet them. .

For combat service support there are also overarching characteristics for success. For the Army these characteristics are anticipation, integration, continuity, responsiveness, and improvisation. These characteristics are outlined in FM 100-10 and closely mirror joint logistics principles incorporated into joint publication 4-0. In an effort to combine both perspectives the author has identified four criteria that will reflect the characteristics of both perspectives.

The criteria used for evaluation of this design are anticipation, sustained tempo, flexibility, and force protection. The author believes that these criteria would produce effective logistics at the tactical level and ensure flexibility to the maneuver commanders. Before reviewing the results it will be beneficial to define the criteria a step further.

Anticipation is the first criteria and really is the key factor in distribution based logistics. Anticipation is the ability to forecast future needs of supported units. Anticipation requires systems that allow situational awareness and prognostics that will send early warning signals. To be successful the information coming in must be quickly matched to the distribution pipeline. This will require systems that link the entire support chain or access pre-positioned assets. This criterion is closely tied to the next criterion, sustained tempo.

Sustained tempo is the ability of the division to dictate the momentum of the battle in order to manipulate the enemy. This could be achieved through the

use of speed or through the lack of speed. If any component of the combat team disrupts the tempo the maneuver commander risks losing the initiative. It is critical that logistics be tailored to facilitate any operation for any amount of time. The success of meeting this criterion will facilitate one portion of the next criterion, flexibility.

Flexibility is the maneuver commander's ability to adjust plans at any time to seize the initiative. The commander should not be constrained by undue pressures or considerations outside the tactical plan. The commander should not be constrained by logistics to execute any plan that he has for a combat unit. The goal is to make logistics a contributing factor, not a distracter. Once this is achieved it is imperative that the structure remain that way, which is why the last criterion is so important, force protection.

Force protection is executing a doctrine that will provide survivability. The ability to protect the assets is critical when most enemy units are three times the size of friendly units. An efficient force is more constrained in this arena. The ability to protect lines of communication and logistics nodes facilitates the other criteria. All four criteria are interdependent on the others and all are critical to the success of warfighting operations at the tactical level. So, in evaluating the new division, if one can say the above criteria are met then one could conclude that the CSS concept for the new design is effective. There may be some efficiencies as well, but the focus is on effectiveness.

To maintain some order in the analysis the author addresses strengths and weaknesses of the design in the order that they are addressed in chapter five. Listed below are the issues identified in chapter five:

1. Extended battlespace
2. Situational awareness
3. Command and control
4. Engineer support
5. Automation specific issues
6. Reserve component forces
7. Multifunctional and dispersed logistics
8. Rear area security
9. Distribution-based logistics

The four criteria will be applied to each of the results from these issues and a comparison of risks will be included. As a reminder it is the 1997 AWE results that will be used for this analysis.

Extended Battlespace

In the discussion of the AWE in chapter five the first issue discussed is the size of the battlespace in which the new division will conduct operations. It was noted that the digitized division is now capable of defending a battlespace that is traditionally covered by a corps. The impacts of this significantly affect the CSS concept. The new structure with the FSCs forward allows for continuous support, however the ability of the enemy to exploit high payoff targets is still evident. Our ability to maintain a corps sized battlespace is primarily in aviation

and artillery units. Support to these units (corps ASPs, which are in the division area) will be in greater danger and the ability to protect them is limited.

Artillery is used to shape the battlefield. Shaping the battlefield is one way of trying to anticipate or force the enemy into a particular action. The velocity by which we use artillery for deep operations will often dictate the tempo for the entire battle. This is often affected by the ability of logisticians to keep ammunition available. The expanded battlefield which the artillery facilitates also promotes flexibility and the opportunity to maintain the initiative. Force protection though is at some risk here. Artillery has always been at risk due to the ability of the enemy to acquire it through radar but the ability to mass combat power quickly enough if it gets hit has been reduced. This is because of lighter forces, fewer weapons, and more distance to cover in order to mass. In this scenario the question is: do the benefits of an expanded battlefield out weigh the risk to force protection? In 1997 it was the ability of the division to conduct battles deeper that was the deciding factor.

With the new design and expanded battlefield it became difficult to maintain a reserve. The force structure and combat power were reduced and the ability of the reserve unit to cross the expanded area in time to impact a battle became an issue. In the AWE the use of a reserve was replaced by using reinforcing units and better orchestrating the deep fight. The use of a reserve always gives the commander more flexibility, but if the criterion of anticipation is observed and reinforcing units are used accordingly the need for that flexibility may not be as critical. Reinforcing units also add to tempo as they are already

part of the battle plan and division momentum. From a CSS point of view it is much easier to support a reinforcing unit rather than a reserve one because it gives logisticians the ability to anticipate needs. Force protection remains the same for either a reinforcing unit or reserve, except that when a reserve unit is out of contact it is usually farther from enemy artillery than a reinforcing unit.

Situational Awareness

The results of the AWE found MCS to be beneficial to situational awareness but that CSSCS was not fully integrated and therefore could not be evaluated. MCS does facilitate all the criteria but it is vulnerable to jamming and hacking. The result is much more damaging than jamming a TOC in the past because MCS is linked to every unit in the division. So, instead of hitting one TOC the enemy could actually hit all TOCs at once by hacking into MCS. As for CSSCS the theory is the same. The interface alone between the two systems could be affected not just by the enemy but by friendly human error as well. A mistake in the AOE is about tripled in significance for Force XXI. The generator that is not refueled by the private in the old division might affect internal memorandums, but now it impacts all staff planning, and the commander's situational awareness. From that point of view, there is much risk associated with automation as a whole.

Command and Control

The ability of the TOC to jump has not been exercised but is critical to the division design. The enemy will have the ability to use nuclear, biological, and chemical weapons (NBC), and likely targets for these kinds of weapons are

TOCs and CSS nodes. If the ability of the TOC to jump is degraded by the new design it could impact significantly on the division success. The CSS for the new design is completely dependent on TOCs and CSS nodes operating around the clock. With distribution-based logistics and virtual inventories as the bases for support it is critical for TOCs to maintain situational awareness. The ability to anticipate needs goes away without the TOCs and the division becomes reliant on the internal ASLs which could maintain the division for about 24-30 hours depending on the class of supply.

The elimination of the rear command post is not significant since all its functions were maintained in the main command post. The one criterion that is affected by it is flexibility. Redundancy allows for more flexibility, and having a rear command post gives the commander some flexibility if the main command post has to jump or is hit. The ability of the DISCOM to work out of the main command post adds to situational awareness as it can now directly coordinate with planners. At the DISCOM the planning focus is the same as the G-3 planners, which is the next phase of the battle. A rear TOC could provide more flexibility for logistics by allowing a separate TOC liaison between division and corps and facilitate rear area security.

Engineer Support

The reorganization of the engineer brigade has produced some concerns. The restructuring put an engineer battalion in support of each brigade and the engineer brigade headquarters went away. While this gives the brigades better control of engineer assets the division commander felt he had lost flexibility to

mass engineer assets at the division level. (26,p.6) From a CSS view the support restructuring has been under much debate. The engineer support platoon is in the base support company of the FSB. The ability to command and control the support platoon is difficult because the engineers are so spread out. This concept was not fully gamed at the AWE and the 1999 AWE will bring better results. Force protection for the engineer support platoon might be an issue for further research.

Automation

In preparation for the NTC rotation the division had to spend a week synchronizing the systems before going into battle. This is significant to CSS. This issue of evolving systems and upgrades may affect interface with higher level units who are on a different version of software. The same is true if the higher unit is not digitized. Because the division will possibly come under a joint task force for certain operations this interface could become a real challenge. Interface problems could affect tempo if resupply is not timely.

Reserve Component Force

A significant impact on CSS is the decision to put reserve component positions into the force structure. For example, the third medic in the track ambulance is a reserve authorization. The intent is to integrate the reserves. However, this position is part of a crew, one that cannot be properly trained when one member is not present. The ability of the division to deploy at full strength without a presidential call up is denied. Once the division does get the soldiers there could be training issues . If the requirements are valid then why take away

the flexibility of the commander by making it a reserve position? It is efficient for peacetime but it is not effective support at the tactical level.

Multifunctional Companies and Dispersed Logistics

The structuring of the FSC was received very well and was successful in supporting the battalions. The maneuver commanders like the dedicated DS support. The FSCs were able to keep up with the maneuver battalions as well. The ability of the BSC to support has been more of a concern. It is an extremely large company and very multifunctional. Currently the commanders are in their second command. Will this be a requirement? Should the commander be a major? This is an issue that will present itself more in the 1999 AWE. The experience level of these company commanders could actually affect the tempo of the battle.

Rear Area Security

Probably the biggest concern for both maneuver and logistical commanders is the issue of rear area security. With the new CSS concept corps units will throughput on the battlefield to the FSCs. This, combined with the expanded battlespace, makes for extremely long MSRs. Also, corps convoys are usually easy targets on the battlefield. The new dispersed approach to logistics means that there is less combat power at the main support nodes for force protection. The extended battlespace makes it easier for enemy special forces to get in to the rear area and the ability of the tactical combat force (TCF) to respond is negatively affected by the larger rear area. The dispersion of assets is positive in that it makes it harder for the enemy to disrupt logistics all at once,

but the ability to protect it is reduced. It is harder for the enemy to see the logistics nodes (smaller), but easier to kill when they are found. Dispersion is actually a passive protection measure and there are benefits, but the issue of LOC security and TOC security must be addressed if the division wants to maintain tempo in the fight. It will be more important to identify critical assets and dedicate protection since there is no ability to cover the entire rear area under the new design. The by-passing criteria must be identified as well. A platoon of enemy infantry can still do a lot of damage to logistical nodes. This will be the biggest concern for the maneuver commander in the logistics field. The TCF, MPs, and ADA units should be synchronized into the support plan to provide force protection.

Distribution-based Logistics

The addition of a distribution manager at each level of support was not really evaluated but will be an issue when CSSCS is fully integrated. The key to velocity management is managers at every level. Because there were individual systems for each functional area in the AOE this was not as critical. Functional managers could manage their commodity as part of the DISCOM staff. Now that logistics will be distribution-based there is not a need for these commodity managers but there is a requirement to have support operations down to the company level. A distribution manager at every level facilitates seamless logistics. Consolidated ASLs contribute as well. This will also reduce the logistics footprint and enhance force protection. It will be the key to flexibility as assets can now be laterally transferred across the battlefield as never before.

A component of this is virtual inventories. Having no stockpiles enhances force protection, but there is an argument that there is less flexibility. Redundancy often provides flexibility, but more risk is involved. If the enemy hits the automation or supply distribution line, there is no redundancy to cover that. On the other hand the commander gains flexibility by being able to move more easily. This is the hardest aspect of the CSS concept for combat arms officers to accept. Everyone likes to know there is something in the other pocket if you get a hole in the first one. There will still be ASLs in the division and it will be critical to correctly identify the types of items that need to be in them.

Whenever there is a comparison of ideas there will pros and cons to support each position. In the case of the new division it is important to remember the context in which the battle will be fought. The enemy is much more unknown. The division must be able to respond to national and international crises and be decisive in war and successful in operations other in war. The division must be part of a joint effort. It must be able to fight in the jungle, desert or city. When considering the risks of the new division, benefits must also be considered. The design was built for the twenty first century. With that in mind it is prudent to summarize what has been analyzed to this point.

The overarching change in the design is the added situational awareness. Based on the systems discussed in chapter five and the results from the AWE it appears that the situational awareness has improved significantly over the AOE design. This allows the basis for the rest of the doctrinal changes which include an expanded battlefield, deep operations, and dispersion. However, it is also the

division's biggest vulnerability. Automation will become the center of gravity if all action is linked to situational awareness. Does the benefit outweigh the risk?

The extended battlespace proved to benefit the division in the AWE but was the simulation realistic enough to really prove it? The risks in this area are high payoff targets, extended LOCs, less flexibility to mass troops, and terrain management. The benefit is that the commander can shape the battlefield and influence the enemy before close fights occur. This enhances force protection by keeping the enemy farther away, so that technology can be exploited.

The implementation of dispersed logistics through use of FSCs and distribution-based logistics has some merit in context to the rest of the division redesign. Technology is such that logistics is in a position to evolve in order to improve support to the new division. Having logistics units in the battalion task force area can minimize the risks of losing logistics support if situational awareness becomes unavailable. Corps throughput does present quite a target and may be the biggest risk to manage. It may be decided that the risk is too large based on the new battlespace and ability to protect conveys. If so more restructuring will have to occur.

Force protection for logistics units in the TFSA is better than ever before. They are dispersed and protected by the battalions they support. The footprint of the FSB is significantly reduced, and therefore reduces its likelihood of being seen, on the other hand its ability to protect itself is diminished significantly. In the new design if the FSB gets hit the whole brigade is not affected because

throughput to the FSCs will still occur. In constrained areas the ability to use MSRs may result in the corps not being able to get supplies up to the FSCs.

Having distribution managers at all levels will help transition the division to the new CSS concept. The managers must be multifunctional and at that level (LT, CPT) this is rarely the case. There will need to be a restructuring of TRADOC schools to teach multifunctional logistics at a lower officer level. The risk in the near term could impact smooth seamless logistics. This risk is probably manageable, although tedious.

The ability of the TOCs to jump is definitely an issue. If the TOC cannot jump the commander will lose much flexibility. The author believes this is simply a timing issue. Presently the prototypes are sensitive and a lot of movement might be counterproductive, but the theory is that they will eventually be able to jump. The connectivity of the division is obviously at risk during this procedure. This can be managed by jumping TOCs at different times and relying on the stable one during the transition.

The use of the reserve component is not significant because they are not built into much of the structure. However, they should not be in the structure unless they can be mobilized without a presidential call-up. This is an example of trying to be efficient but not effective. This is an issue of concern because if the intent is to design a structure that will win wars then the constraints should not be placed on the design. Constraints in this case may be a result of politics or an attempt to save money, but the result is a less flexible division which is ironic because so much technology has been placed in the design to add

flexibility. The considerations for the design should be solely tactical or one incorporates risk from the beginning.

The analysis that was conducted in this chapter found much risk in the new design. There is always risk in every design of this nature. The question remains do the risks outweigh the benefits? The CSS concept seems to match the intent of the division design. The benefits are great in theory. The only area that incurs too much risk is force protection. The rear area is virtually unsecured in the current design. That is not to say it could not be adjusted. The use of MPs, ADA, and a TCF are critical, but these units have combat missions that integrate into the close battle as well. To support this design it will be necessary to develop new doctrine on rear area security and either identify corps units that will enhance the security, or joint units that must be incorporated in a direct support role.

These results and analysis bring some very logical conclusions, which will be discussed, in chapter seven. In order to put the conclusions in proper context the chapter will begin by restating the environment in which the new design will fight. There will be an overview of the major changes and conclusions that will be drawn from the restructuring and the research question will be answered. In addition, further research will be identified at the end of the chapter.

CHAPTER 7

CONCLUSIONS

Understanding the digitized division's operating environment is key to addressing the impact of its restructuring. It is within this new environment that the new design must succeed. It is important then to review what the environment will look like in the year 2010 before formulating conclusions to answer the research question.

Reviewing the design concept and principles helps to understand the intent of the division redesign. With this intent in mind some conclusions can be drawn about whether it is supportable by the restructured DISCOM. The division design incorporates a centralized CSS concept. This concept reflects a shift from supply based CSS in the AOE to a distribution based system. This is feasible through the use of new technology. The new concept combines situational awareness with efficient delivery systems to provide seamless logistics. The use of virtual inventories or inventories in motion allows speed of delivery by bypassing many levels of support from factory to foxhole. Logisticians can control the speed and volume of the distribution system. The new visibility allows logisticians to redirect and mass CSS assets to provide a surge capability to maneuver commanders.

The dispersion of logistics assets and change from functional support to multifunctional tailored units (FSCs) enables CSS to be fluid in both a linear or

non-linear environment. By maintaining habitual support to the maneuver commanders it allows the commander to focus on the fight while the logistician controls logistics in support of his plan. (Force XXI Division Concept 1998,1)

CASCOM is the proponent that developed the CSS concept for the new design, which was discussed in chapters four, five, and six. (TRADOC Press Release) What must be decided is whether or not the CSS concept supports the division redesign and future environment. Some of the CSS realities are greatly increased battlespace; longer MSRs; reduced supply stocks, transport and manpower, and increased dependence on echelons above division (EAD). All these realities lead to an increased need for rear area security to assure throughput to the FSCs. Some of the empirical changes that were a result of the new design are:

1. Command and control
2. Distribution based logistics
3. Consolidated ASLs
4. Replace forward--fix rear
5. Anticipatory information
6. Multifunctional units
7. Combined organizational and direct support maintenance

What is the impact of these changes? The impact is a highly efficient system of distribution and dispersion. The core question is will it be effective in the year 2010. Can the FSCs support the maneuver commanders? The answer

is yes. The ability of the FSCs to support the maneuver battalions was proven successful in the AWE. Critical to their long term success is the ability of the enablers and digitization to support them. The concept is good, but that does not make for effective logistics. The enablers must be in place and the division can not expect to be successful as a whole until they are in place.

The author concludes that the concept is sound and does support the new division fight. There are several concerns that should be addressed at this point. Force protection is vulnerable for CSS units on the battlefield. The concern is significant enough to warrant further study and possibly new doctrine in the allocation of MPs, ADA, and corps units to support the DISCOM.

In the beginning of this study the author examined the difference between changes that enhance effectiveness and changes that enhance efficiencies. Looking back to the new concept it is critical that it be both effective and efficient. In conclusion the author found several aspects of the new design to contribute to logistics effectiveness. Situational awareness provides the logistician an ability to see unit readiness better than ever and this in turn lends itself to anticipation of needs. Actually anticipation has always been a logistics characteristic, but in the new concept technology improves the effectiveness to a greater degree making the new design much more effective than the logistics of AOE. The use of FBCB2 and CSSCS to manage tasks cuts coordination time down significantly. The ability to laterally transfer supplies has not really existed in the AOE and so it has made an improvement to support.

The ability to positively control assets and link up at multiple echelons has significantly improved. The ability to control logpacks with new transportation technology increases the commander's flexibility when there is a requirement to redirect or the battalion moves locations.

Some efficiencies have occurred as well and added to effective support across the battlefield. The first of these is near-real time information, status, and requirements. The efficiency is seen mostly in the efforts by staffs and leaders to make decisions. It allows the logisticians to stay one step ahead of the tacticians. The other efficiency is the increased agility due to consolidated ASLs and smaller footprints. There are no longer idle assets on the battlefield. This gives the commander an increased amount of flexibility to maneuver unconstrained by logistics. The distribution pipeline is now oriented forward. There are not several functional pipelines to monitor. With only one pipeline to coordinate managers can keep assets flowing as far forward as the FSCs. Instead of stopping at each level of supply the assets can move straight down to the units. This will increase the tempo on the battlefield significantly.

There are several issues that arise out of the discussion of the new design that require further study. One of the biggest debates on the FSCs is the question of who should command and control them. There is an argument that the maneuver commanders would have more flexibility if they controlled the FSCs because then they could skip coordination through the DISCOM. The other side of the argument is that centralized logistics cannot work properly

without command and control of all logistics in the DISCOM. There is also an argument that the logisticians are better trained to manage distribution-based logistics. This frees the maneuver commander from logical considerations yet he still has direct authority as to where the FSCs will be located since the battalions have ownership of the terrain. In the AWE the relationship has worked fine with the FSCs in direct support of the battalions. The author believes that letting maneuver commanders control the FSCs would slow down the military planning and decision making (MPMD) process of the commander and staff.

Another consideration is the impact on women in the CSS fields. According to the combat exclusionary rule women cannot work below brigade level in a combat unit. Now that the FSCs are located in the TFSA and part of corps logpacks, does the intent of the rule apply? Obviously, women will be in a battalion tactical area. Will the new structure cause the rule to be reexamined? This would be a good follow on study.

Medical support was virtually unchanged in the new division. The author believes that medical supplies should be incorporated into the consolidated pipeline of support. There is no apparent reason to keep them under a separate system. The location of medics on the battlefield and distribution of medical supplies should be considered for further research.

In conclusion, the structure has been validated by the author as an effective system. However, certain positions and distribution assets have been allocated as reserve component positions or corps augmented missions. The

author strongly feels that the effectiveness of the division is in its ability to be self-supporting. Relying on the reserve component is not effective at the tactical level. This concept is true when it comes to corps support as well. Corps augments certain field services such as water purification. If a need has been identified and a corps slice allocated to be in the division area to support it then why not incorporate it into the division structure? The footprint will be the same whether it is a corps unit or a divisional unit. It would provide the division commander the flexibility of being self-supporting, at least for the first thirty hours of the battle.

The author's final conclusion is that the FSC does provide effective logistics to the maneuver battalions of the digitized division. The enablers discussed add ability for logisticians to manage support more effectively and provide a surge capability that was lacking in the AOE design. The maneuver battalion commander's flexibility is enhanced by the ability of the FSCs to tailor support and consolidate resources. The single biggest vulnerability in the design is the security of the rear area and LOCs. This absolutely must be addressed or maneuver commanders will be cut off from reinforcing support.

> We live in a dynamic world, an era of contradictory trends shaped by two great forces, one strategic, the other technical – the advent of the information age. The scale and pace of recent change have made traditional means of defining future military operations inadequate. Change will continue, requiring our Army to recognize it as the only real constant. (TRADOC Pam 525-5 1994. 1)

In the final analysis the new division is an exciting structure that has potential for growth into the Army after next. The design truly captures the strength of technology and enthusiastic leaders. The smaller, more agile force is lethal and decisive and the CSS concept facilitates unconstrained tempo and flexibility. This design is one step of many in the development of the Army After Next.

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