

**STRATEGY
RESEARCH
PROJECT**

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**CONCEPT FOR CONTINGENCY FORCE ADVANCED
WARFIGHTING EXPERIMENT**

BY

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USAWC STRATEGY RESEARCH PROJECT

**Concept for Contingency Force Advanced Warfighting
Experiment**

by

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ABSTRACT

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U.S. National Security Strategy documents support the need for digitization and modernization of rapidly deployable contingency forces. Joint Vision 2010 and Army Vision 2010 describe the capabilities required by contingency forces to achieve the objectives of U.S. strategy. TRADOC Army XXI concepts and the Army After Next study describe the required future operational capabilities needed for increasingly lethal, survivable, and deployable contingency forces.

Despite this, the focus of Army experimentation and digitization to date has been on the heavy divisions which are and will continue to be the least deployable units in the Army force structure. The Army's contingency divisions are behind in scheduling and funding to achieve the Army XXI capabilities already planned for the heavy force.

To alleviate this problem, TRADOC has supported the development of a Contingency Force Advanced Warfighting Experiment (AWE) in Fiscal Year 2000. Such an AWE would provide a focus for contingency forces evolution through Army XXI to Army After Next. It would also make available to these forces a limited number of advanced technologies to accelerate the process of digitizing and modernizing these units. TRADOC's proposal should now be refined into a concept and plan that can be scheduled and funded. A Contingency Force AWE is the best near term opportunity to achieve the capabilities required by the National Security Strategy.

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PURPOSE AND SCOPE

The Army has divided its journey to future warfare capability into two major categories: *Force XXI* and *Army After Next* (AAN).

Force XXI is a mid-term look beyond today's structure and capabilities to a potential "next Army" out to about 2010, called Army XXI. Force XXI has largely been explored through a series of Advanced Warfighting Experiments (AWE) under the U.S. Army Training and Doctrine Command's (TRADOC) Joint Venture experimentation path, in progress since 1994. Army XXI is being designed now based on the insights gained from the AWEs.¹

The far-term effort is Army After Next. AAN is the flagship project among several studies which have as their core purpose "to inform the long range planning process and assist the Army's leaders to establish priorities and earmark resources to maintain force readiness today and in the future."² The AAN project has been given the following mission statement:

Conduct broad studies of warfare to about the year 2025 to frame issues vital to the development of the U.S. Army after about 2010 and provide those issues to senior Army leadership in a format suitable for integration into TRADOC combat development programs.³

The Army Chief of Staff's guidance to the AAN project was to "Define what we want in the Army After Next so that...Force XXI expands to link Army XXI and Army After Next" and that Force XXI does not get disjointed from long term vision." Additionally, the

CSA specified that AAN would "focus our R&D efforts" and "narrow the gap between heavy and light forces."⁴

With two notable exceptions, the Army's Force XXI experimental efforts have primarily focused on the components of the heavy division. The first digitized corps, consisting of three heavy divisions scheduled for completion in Fiscal Year (FY) 2004, will account only for heavy force transition to Army XXI. Meanwhile, the early entry contingency forces in the most likely to be deployed XVIII Airborne Corps have only partial and piecemeal schedules for modernization, with incomplete and indefinite plans for Force XXI organizational changes. Beyond Force XXI, our current early entry forces are the most in need of conversion to Army After Next organizations and technologies, and given their deficiencies in firepower and survivability, will benefit the most from Army After Next innovations. Given this, it is imperative that TRADOC begin experimentation to produce the Force XXI improvements for contingency forces that will lead to Army After Next concepts, organizations, and systems for these forces.

TRADOC is already exploring a concept for such an AWE. This paper will develop the thesis that near term experimentation focused on early entry contingency forces is a critical prerequisite to developing and fielding Army XXI and Army After Next capabilities. The purpose of this paper is to assess the emerging AWE concept and to further refine the concept,

establishing the front end products necessary to develop a substantive, scheduled program. To establish the thesis, it is necessary to first review the national security strategy requirements that define future goals for Force XXI and Army After Next, examine the TRADOC Force XXI and AAN programs as well as the science & technology process that supports it, and analyze the funding and timeline problems associated with the transition to future capabilities.

NATIONAL SECURITY STRATEGY REQUIREMENTS

The operational requirements for a contingency force AWE can be traced from U.S. national security documents through the vision and concept statements of the U.S. Army Training and Doctrine Command. The forces and capabilities required by these documents support the need for an immediate focus on contingency forces.

The current strategy declaration, A National Security Strategy for a New Century, requires the armed forces to be capable of supporting the Shape, Respond, and Prepare Now approach to U.S. strategy, across the entire spectrum of conflict.⁵ It reaffirms the requirement to be capable of fighting two major theater wars, maintaining the "ability to rapidly defeat initial enemy advances short of enemy objectives in two theaters, in close succession."⁶ In describing the requirements of the Prepare Now function, it articulates the need to "foster

innovation in new operational concepts, capabilities, technologies and organizational structures."⁷ It further argues that the U.S. must "increase modernization funding to both introduce new systems, and to replace aging Cold War-era equipment as it reaches the end of its service life."⁸

In the Quadrennial Defense Review, the Secretary of Defense approved an Army force structure of ten divisions and 480,000 end strength to support the Two Major Theater War strategy, a 15,000 decrease to current end strength.⁹ He identified Joint Vision 2010 as the template for maintaining military dominance in the Revolution in Military Affairs. He acknowledged the Army's *Force XXI* and *Army After Next* processes as the means of "identifying new concepts of land warfare that have radical implications for the Army's organization, structure, operations, and support." He specifically identified the Force XXI Modernization Plan for acceleration and described the *Army After Next* program as a "comprehensive initiative designed to better understand the probable nature of warfare 30 years into the future and provide focus to today's development efforts." While arguing for a balance between current readiness and the need to build the future force, he declared it "essential that the Department increase procurement spending now."¹⁰

The National Defense Panel placed an even greater emphasis on modernization, arguing that the U.S. "needs to launch a

transformation strategy now that will enable it to meet a range of security challenges in 2010 to 2020." The panel identified an estimated shortfall of \$5 to 10 billion to support an immediate transformation effort.¹¹

The National Military Strategy supports the conclusions of the QDR. In his introductory cover letter, then Chairman of the Joint Chiefs of Staff Shalikashvili stressed that "The Chiefs and I strongly agree that the force levels recommended by the Secretary in the QDR are the minimum necessary to carry out this strategy at prudent military risk."¹² It highlights the strategic concepts necessary to accomplish the National Security Strategy. Several concepts directly affect the requirement for future contingency forces:

Strategic Agility is the timely concentration, employment and sustainment of US military power anywhere, at our own initiative, and at a speed and tempo that our adversaries cannot match.

Power Projection is the ability to rapidly and effectively deploy and sustain US military power in and from multiple, dispersed locations until conflict resolution.¹³

To realize these concepts and achieve the required future capabilities, the strategy calls for a "transformation" of our forces.

Through a rigorous process of experimentation, assessment, refinement, and doctrinal development, we can meet our responsibility to maintain ready forces today while taking steps to transform those forces to be superior tomorrow.

It means harnessing new technologies to give US forces greater military capabilities through advanced

concepts, doctrine, and organizations so that they can dominate any future battlespace.¹⁴

Joint Vision 2010 also focuses on operational concepts that require increased future capabilities for contingency forces. The concepts of Dominant Maneuver, Precision Engagement, Full Dimensional Protection, and Focused Logistics envision a force that will be increasingly capable of global rapid deployment to respond to future contingencies.¹⁵ Information superiority (involving both offensive and defensive information warfare) is specifically highlighted as a required warfighting capability that integrates and enhances these operational concepts, resulting in a synergy called Full Spectrum Dominance.¹⁶ It acknowledges that to achieve these future capabilities, "We will need a responsive research, development, and acquisition process to incorporate new technologies"¹⁷

Army Vision 2010 likewise documents the requirement for information age technologies and specifically ties information dominance to the other patterns of operation. The pattern entitled Project the Force specifically highlights future requirements of contingency forces to achieve the capabilities described in Joint Vision 2010 and Army Vision 2010.¹⁸

To summarize the trends in U.S. national security documents, three clear themes emerge: 1) The continued necessity of a 10 division force to support the nation's Two Major Theater War strategy, 2) A requirement for improved future contingency forces

to support the national strategy, and 3) A need to increase modernization funding to achieve these improvements.

TRADOC'S FORCE XXI AND AAN PROCESS

As stated earlier, TRADOC is moving on the parallel mid- and long-term tracks of Force XXI and AAN to achieve the future capabilities required by our national security strategy. In order to evaluate the utility of a contingency force AWE on this process, it is necessary to examine the current status of the two projects.

JOINT VENTURE EXPERIMENTS TO DATE

To date, only two AWEs provide insights which can directly support contingency force evolution. The Warrior Focus AWE examined digitization and "Own the Night" issues within the context of a light infantry brigade; TF XXI (March 1997) examined the same issues in a light infantry battalion within the context of a heavy force organization (i.e., attached to a heavy brigade). The insights derived from these AWEs focused on the value of digitization and its effect on Command and Control, as well as the impact on the Own the Night technologies. Additionally, the inclusion of the Javelin, Mortar Fire Control System, Digital TOC, Target Location Observation System, and Lightweight Video Recon System in the TF XXI light infantry battalion offered a first look at the potential of the digital

linkage between sensors and shooters through digital command and control systems.

The Division XXI AWE (November 1997) focused on the effect of digitization on combat capability, as evidenced by the AWE hypothesis:

IF: The Force XXI Division operational and organizational concept enables information dominance and enhanced battle command capabilities,

THEN: Increases in lethality, survivability, sustainability, and tempo will be gained across the force.¹⁹

While offering insights which could indirectly impact on future contingency forces, the critical impact of this AWE has been to drive the design of the future heavy division and the transition of the first digital heavy division by end of FY 00 and the first digital corps of three heavy divisions by end of FY 04. What has not occurred is an experiment nor a budgeted timeline for a similar migration of contingency forces to a comparable Army XXI capability.

THE LINKAGE BETWEEN FORCE XXI AND ARMY AFTER NEXT

The path to AAN begins with the recent AWEs, continues through the Force XXI process to the fielding of Army XXI and beyond via the AAN project to evolve to an Army After Next capability. The focus of the Force XXI process is on increasing Mental Agility (Knowledge); the focus of the AAN process is on increasing Physical Agility (Speed). The Force XXI process

implements the requirements of Joint Vision 2010 and Army Vision 2010 and aims at an initial Army XXI capability by 2010. The focus of the AAN project is on the possible force enhancements from 2010 to the 2025 timeframe.²⁰

The current force is governed by published doctrine. Force XXI is based on published and emerging concepts, primarily the overarching concept in TRADOC Pamphlet 525-5 with its 525 series supporting concepts. The Army After Next process is producing ideas which can later be developed into concepts. The evolution through Army XXI to Army After Next is intended to be a spiral process of experimentation, feedback, and development, utilizing a combination of Research and Study, Science and Technology, simulations, and Joint/Army Experimentation.²¹

FORCE STRUCTURE PLANNING

The relationship between Force XXI and Army After Next is reflected in projected timelines currently described in TRADOC briefings. It is clear that the entire ten division Army cannot be converted at once to Army XXI. Beyond the first digital corps scheduled for FY 04, TRADOC is briefing a timeline that would digitize the Army's ten divisions and three cavalry regiments by 2010.²² A modernized and digitized initial Army XXI capability for Force Package 1 is projected for 2010. An initial AAN Force Package 1 capability is projected between 2015 and 2020.²³ The

evolutionary character of this transition means that at any given snapshot in time multiple levels of modernization will coexist.

Current TRADOC briefings describe a 2010 "potential" force of four modernized Army XXI divisions and six Army of Excellence (AOE) divisions.²⁴ Based on the digitization fielding plan, the AOE divisions in general will be digitized after the Army XXI divisions.²⁵ In concrete terms, this accounts for the three modernized and digitized Army XXI heavy divisions budgeted for completion in 2004 (4th Infantry, 1st Cavalry, and 3d Infantry), one modernized and digitized contingency division (10th Mountain has been mentioned by Army leaders), three AOE divisions (1st Infantry, 2d Infantry, and 1st Armored) at varying stages of digitization, and the remaining contingency divisions (82d Airborne, 101st Air Assault, and 25th Light) digitized behind the Army XXI heavy divisions and modernized below the levels of Army XXI.

For the period of Army XXI from 2010 to 2025, characterized by both Army XXI and AOE divisions, a third type force has emerged. TRADOC is now discussing experimentation with "Battle Force Groups" characterized by decreased requirements for strategic lift, increased tactical mobility with a combination of air and ground combat forces, increased lethality for decisiveness in entry operations, and the capability to conduct "operational level strike operations." The structures and characteristics described by TRADOC are consistent with the

"Strike" Battle Groups proposed by Douglas A. Macgregor in his controversial book Breaking the Phalanx.²⁶ This force concept would also address the Army Science Board's recommendation that the Army have "immediate follow-on" forces to its early entry capabilities, to be available before the heavier "reinforcing" forces.²⁷

The objectives of this experimentation are described below:

Conduct experimentation with advanced concepts and technology to develop a highly lethal, strategically deployable and tactically agile unit which exploits advances in stealth, mental agility, and physical agility to provide operational level strike capabilities.²⁸

TRADOC recently announced that the 2d Armored Cavalry Regiment (Light) will "evaluate the strike force concept,"²⁹ then be the testbed unit to develop this capability through Army XXI to Army After Next.³⁰ As part of the contingency force concept, this potential future force will provide an immediate reinforcement capability to forced entry units.

The "possible" Army After Next force is expected to be a mix of organizations at different levels of modernization. A recent TRADOC vision document postulates five different "pieces" in the force mix: 1) Special Operating Forces, 2) Strike Forces (an evolution of the Battle Force Groups), 3) A Modernized Light Infantry "Expeditionary" Corps (including an airborne, air assault, and one or two light divisions), 4) a Modernized Heavy "Mounted Expeditionary" Corps, and 5) a Legacy Heavy Corps (with

"legacy systems and earlier generations of technology").³¹ The implications of this vision on contingency forces is significant. Given that the airborne, air assault, and light division types are assumed in the force mix for Army After Next, it again begs the question of when the funding and schedule of contingency force modernization will catch up to the heavy force.

In summarizing the status of Force XXI and Army After Next as it affects contingency forces, one can draw the following key conclusions:

- 1) TRADOC has come an incredibly long way since 1994 in visualizing and experimenting with the future capabilities required by the nation.

- 2) Enhancements to contingency force capabilities is central to Joint Vision 2010, the Battle Force Group/Strike concept, and emerging AAN capabilities.

- 3) Contingency forces are already behind the heavy force in experimentation and in fielding plans and funding.

Recent Science and Technology (S&T) programs may be able to provide short-term and mid-term improvements to contingency forces. It is time to examine the role of S&T in the modernization effort.

THE SCIENCE AND TECHNOLOGY EFFORT

The Army's Science & Technology program consists of three budget activities -- Basic Research, Applied Research, and

Advanced Technology Development. The Defense Acquisition Deskbook defines these categories succinctly:

The objective of basic research is to produce knowledge in a science or engineering area that is militarily relevant. Basic research is inherently a long-term investment, with emphasis on opportunities far into the future...

Applied research provides proof-of-concept experiments and evaluations built around models and laboratory experiments.

Advanced technology development programs extend technology development and demonstration to a higher level of technological maturity and confidence in the enhanced military capability that could be provided by the new technology.³²

In the FY 98 Army Budget, these categories comprise 24% of the Research, Development, Test and Evaluation (RDT&E) budget,³³ up from 21% of the RDT&E total in FY 97.³⁴ The RDT&E budget appropriation is just under 7 1/2% of the Army FY 98 budget, down from almost 8% of the FY 97 budget.³⁵ The trend over the period of the Army's drawdown is that S&T funding has been in decline as the Army prioritized unit readiness over modernization.³⁶

The Army's Science & Technology program is managed by the Assistant Secretary of the Army for Research, Development & Acquisition (ASA (RDA)). In managing the Army's S&T program, the ASA (RDA) performs several key functions--he provides S&T policy, provides S&T representatives to TRADOC-led Integrated Concept Teams, and approves and resources various advanced technology programs.

Other Army commands and agencies play key roles in the S&T process. The Army's Deputy Chief of Staff for Operations and Plans (DCSOPS) prioritizes and resources "organizations and materiel requirements" for the Chief of Staff. The TRADOC Commander approves warfighting concepts and approves requirements, including materiel requirements; specific to the S&T process, TRADOC develops and publishes a Future Operational Capabilities list which is intended to guide the selection and prioritization of S&T projects. The Army Materiel Command (AMC) conducts S&T research and development, primarily through its functional Research, Development, and Engineering Centers.³⁷

Each of the key agencies have roles and responsibilities for aligning Army requirements with Science & Technology selection and funding. To accomplish this, the ASA (RDA), TRADOC, and AMC use a "series of reviews of current and proposed S&T activities" to "guide focused research." These reviews include an "annual assessment of all proposed Army-funded S&T projects." Also, an Army Science and Technology Working Group (ASTWG) reviews and approves "a list of the top 200 Army Science and Technology Objectives (STO) candidates--the Army's most important S&T projects.. (u) this list builds from the annual assessment and is then listed in the Army Science and Technology Master Plan (ASTMP).³⁸ The aim of this triage and prioritization is to focus the S&T effort on what has been termed "essential S&T," to get the most out of the declining available dollars.

This process has a direct relationship to Force XXI and AAN. TRADOC has established a goal of 30% of Basic Research funding focused on "AAN supporting" research objectives. TRADOC and the development community have already focused on a "short list" of technologies in the tech base that will support the long term evolution of AAN.³⁹ The Army's RDECs and the Defense research and development agencies have adopted and are briefing Force XXI AAN objectives as the basis for their Applied Research and Advanced Technology Development efforts. Most significantly, the new Advanced Technology program categories are focusing increasing S&T efforts and funding on TRADOC user requirements.

The approved STOs listed in the ASTMP "provide the basis for Advanced Technology Demonstrations (ATD) which showcase a variety of advanced technologies and their potential merit."⁴⁰ "ATDs seek to demonstrate the maturity and potential of advanced technologies for enhanced operational capability and/or cost effectiveness."⁴¹ The products from the ATDs then provide the technology feeders to new acquisition programs, existing program upgrades, and Advanced Concept Technology Demonstrations (ACTDs).

As part of the Acquisition Reform process, ACTDs are a key new category of Science & Technology (S&T) experimentation. ACTDs fall under the supervision of the Under Secretary of Defense for Acquisition and Technology. Published guidelines for ACTD management plans define an ACTD as follows:

The primary goal of an Advanced Concept Technology Demonstration (ACTD) is to evaluate a significant, new

military capability, based upon mature advanced technology(s), in a real-time operation, and on a scale large enough to clearly establish operational utility and system integrity. The demonstration is jointly sponsored and implemented by the operational user and materiel development communities, with approval and oversight guidance from the Deputy Undersecretary of Defense for Advanced Technology (DUSD(AT)).⁴²

At the ACTD Manager's Conference in 1996 the Under Secretary of Defense for Acquisition and Technology, Dr. Paul G. Kaminski, further defined the purpose of ACTDs as providing three significant opportunities:

First, ACTDs provide experienced combat commanders with an opportunity to develop operational concepts that address military needs prior to major acquisition decisions and large dollar commitments.

Second, they provide the Services with an approach for compressing acquisition cycle time and for offering direct and immediate solutions to urgent theater needs.

And third, they provide the Department of Defense with a mechanism for fostering the kind of innovation needed to confront the wide range of military missions and potential threats confronting the U.S. today and in the future.⁴³

ACTDs are relevant and significant to contingency forces today because they are funding and supporting new technology insertions into the contingency divisions that are not yet scheduled or funded for Force XXI modernization. Specifically, the Rapid Force Projection Initiative (RFPI) ACTD, the Military Operations in Urban Terrain (MOUT) ACTD, and their supporting ATDs are providing near term enhancements to units of the XVIII Airborne Corps.

The RFPI ACTD is investigating technologies for improving early entry forces warfighting capabilities.

The RFPI ACTD will provide early entry forces with advanced technologies and systems to make them more survivable when encountering a heavy force. The purpose of RFPI is to address the operational capability requirements, developed by TRADOC, for lethality and survivability of light forces while maintaining the inherent strategic deployability of these forces. RFPI is based on a "system of systems" concept of Hunters and Standoff Killers and will demonstrate technology solutions which greatly expand the battlespace of light forces. The operational capability enhancements offered by RFPI will enable the light force commander to mass precision fires on threat forces, including armor, at ranges beyond which they can respond.⁴⁴

The ACTD systems include digital sensors, digital shooters, and digital C4I (Command, Control, Communications, Computers, and Intelligence) linked digitally to increase survivability, lethality, acquisition, and control of battle tempo.⁴⁵

The notion of linking digital sensors, shooters, and C4I fits precisely into the "systems of systems" paradigm put forth by then Vice Chairman of the Joint Chiefs Admiral William Owens. He argued that this linkage "creates operational synergies by combining three systems normally considered separately -- those that provide battlespace awareness, those that enhance command and control, and those that create precision force."⁴⁶

The significance of the RFPI ACTD goes beyond exploring new technologies for early entry forces; the ACTD is providing a limited quantity of digital hardware in the sensor, shooter, and C4I categories to the supporting units, the 101st Division and

the XVIII Airborne Corps Artillery. While this is no substitute for a comprehensive modernization process, it is providing an opportunity for TRADOC, AMC, and the ASA (RDA) the opportunity to focus on new technologies for these forces and to actually increase the combat capability of these units in the process.

The MOUT ACTD is likewise examining the "system of systems" potential of technologies focused on the particular environment of MOUT. This effort integrates the evolution of the "soldier system" concept leading to the Land Warrior program; the ACTD focuses at the small unit level (individual to battalion level). The ACTD will include technology insertions from the Defense Advanced Research Projects Agency's (DARPA) Small Unit Operations (SUO) program, which is focused on digitally linking soldiers and teams together in restricted line of sight environments.⁴⁷ The units involved in this ACTD include the Ranger Regiment, the 82d Airborne Division, and the U.S. Marine Corps. Like the RFPI ACTD, the MOUT ACTD will leave behind "residual" systems for at least two years after the demonstrations to improve the combat capability of the participating units. These capabilities could become a permanent part of the units if the Army decides to fund them beyond the ACTD timeframe.

It is clear here that the emergence of ACTDs has had a significant impact on providing a focus for contingency forces not currently present in the Army's funded modernization process. Each of the contingency units not on the modernization timeline

is participating in the S&T efforts described above. While these efforts will provide some short-term improvements to these units, it does not solve the larger problem of bringing the contingency forces up to the Army XXI capabilities planned for the heavy divisions. This "modernization gap" is one of the critical reasons for contingency force AWEs beyond the currently funded ACTDs.

THE MODERNIZATION GAP

In his book Blunting the Sword, Dennis S. Ippolito clearly describes the budgetary squeeze that the Department of Defense is in for the long term, which has left much of the Army's modernization goals unfunded.⁴⁸ The Department of Defense and the Army have consistently documented the need for increased Research, Development, Test & Evaluation, particularly in the Science & Technology budget activities. In the QDR, the Secretary of Defense identified the need for increasing defense procurement funding to \$60 billion a year by FY 2001 to support modernization.⁴⁹

However, the Army remains significantly underfunded to achieve both current readiness and future modernization. The Army's leadership took the calculated risk during the last few years by maintaining near-term readiness at the expense of the modernization accounts, in essence "mortgaging the future" to get through the drawdown. Additionally, the Army receives an extremely small share of defense procurement dollars. A recent

article in Strategic Review describes the problem, noting that the 1998-2003 Future Years Defense Plan gave the Army

"only 15% of the Defense Department's research, development, testing and procurement funds over the life of the plan... Beyond the end of fiscal 1998-2003 defense plan, the Army appears to remain in a state of permanent structural inferiority in acquiring new technology when compared to other services."⁵⁰

The modernization shortfall is estimated to be between \$3-5 billion annually.⁵¹ The cost of funding the big ticket acquisition programs like Crusader, Comanche, Apache, and Abrams upgrades exacerbates both the shortages in the S&T programs and the lack of a contingency force comprehensive modernization plan. The recent decision to kill the Armored Gun System program, despite its clear requirement in the 82d Airborne Division, is a prime example of the effect of the procurement dollars shortfall.

Given this shortfall, the Force XXI timeline for Force Package 1 in FY 2010 is at risk, particularly in the light contingency forces that represent the strategic strike capability for Army XXI. This is of particular concern given the lead times required to make organizational redesigns (4-8 years) and materiel redesigns (5-17 years)⁵²; any delay in modernization driven by future budget shortfalls will adversely affect contingency forces which are scheduled late anyway and most in need of change. If the Army cannot independently solve the budget shortfalls that limit modernization, what steps can be taken to leverage the funding and programs that are available to move the

contingency force forward? The answer lies in the recent Infantry School and TRADOC proposal for a contingency force AWE.

TRADOC'S AWE CONCEPT

The current concept for a contingency force AWE originated in 1996 at the Infantry School, which has proponency for many of the Army's early entry forces. The Infantry School proposed an AWE to TRADOC Headquarters in 1997. A contingency force AWE was included in the Army Experimentation Campaign Plan briefed by TRADOC to the General Officer Synchronization Meeting in December 1997.⁵³

TRADOC describes the following Objectives and Goals for Army XXI contingency force experimentation:

Objectives: To evaluate concepts, force structure and weapon systems required by contingency forces (Light, Heavy, SOF) conducting entry and decisive operations in a JTF configuration.

Goals:

Evaluate technologies, doctrine, and organizations in a JTF configuration capable of conducting an asymmetrical entry operation with follow-on fight...

During the conduct of vertical entry operations from assault through conclusion of decisive operations.

Enroute information dominance including mission planning and rehearsals.

Digital C4I connectivity and situational awareness at strategic and operational ranges.

Develop supporting technologies to integrate into FXXI Land Warrior program.

Evaluate joint logistics initiatives and sustainment operations.

Deliver tailored logistics packages/sustainment directly to joint contingency forces.⁵⁴

The Dismounted Battlespace Battle Lab (DBBL) at Fort Benning has further refined a set of AWE goals, labeled "Anticipated Improvements":

Increase the lethality /survivability of Joint Contingency Forces in the close fight on restrictive terrain ("Close the Gap")

Enhance standoff capability for Joint Contingency Forces against all enemy threats.

Develop digital C4I from alert through mission completion.

Enhance enroute planning/mission rehearsal capabilities.

Set-up for continuation of experimentation with follow-on Strike Force Axis.

Increase digitization, C4I, and situational awareness for Joint Contingency Forces.⁵⁵

These goals are consistent with the Future Infantry Vision published by the Infantry School, which include the requirements to "maintain an overwhelming overmatch in all future operational environments" and to "deploy forces efficiently and quickly and support deployed forces as required."⁵⁶

TRADOC has identified four fundamentals for the AWE:

- 1) The AWE should be joint, sponsored by Atlantic Command and including its components.

- 2) It should leverage the ACTDs, DARPA Small Unit Operations, and other S&T programs.

3) It should "close the gap" between contingency/light forces and heavy forces.

4) It should establish the "pathway to modernization and digitization of contingency/light forces."⁵⁷

DBBL has developed the following hypothesis to govern the experiment:

IF: a joint contingency force is provided advanced technologies, enhanced C4I, digital connectivity and appropriate doctrine in an integrated fashion,

THEN: the joint contingency force should achieve significant improvements in lethality, maneuver, force protection, command and control, and focused logistics during the conduct of a forced entry operation.

The above objectives, fundamentals, and hypothesis that define the parameters of the AWE also provide the opportunity to move beyond the current S&T efforts while leveraging their insights, technologies, and funding sources. Given the modernization gap that exists, it is clear that some focused effort is necessary if contingency forces are going to reach an Army XXI capability in conjunction with heavy forces. Since TRADOC has accepted a contingency force AWE as the "pathway," it would be useful to examine this AWE to a greater degree of detail in order to offer some concept and implementing recommendations which move the AWE from a concept to a planned and scheduled activity.

AAN required capabilities. This would facilitate a logical migration from Force XXI to AAN and ensure that the S&T supporting efforts can consistently map their research efforts towards the long-term goal. Examples of this would include:

Increased Information Dominance (not just enroute).

Increased Physical Agility.

Increased Control of Battle Tempo.

Increased lethality & survivability of early entry units with decreased deployment times.

CONCEPTS LINKAGE

Given the mid-term focus of the Army XXI effort, the AWE should baseline on TRADOC Pam 525-5 and the supporting concepts, with Force XXI concepts representing the 2010 timeframe; emerging TRADOC AAN ideas should then be used as alternative case concepts for analysis and simulation which covers the 2010 to 2025 timeframe. Additional alternative approaches both within and outside of DOD could reference from these cases as necessary.

PROGRAM LINKAGE

TRADOC has already determined that current S&T programs will contribute to the AWE, in particular the RFPI ACTD, MOUT ACTD, and DARPA's SUO program. The intent of the AWE is to enhance the capabilities of the Army's contingency forces in the early entry stage of operations, which will directly contribute to the AAN

objective of preempting an opponent's capability to seize objectives and "set" while the U.S. organizes its forces for deployment. Therefore, the mid-term Force XXI focus of the AWE should be a bridge between the near-term ACTD capabilities (FY 98-00) through Army XXI (2010) and the far-term goals of AAN (2025). By directly tying together the Force XXI and AAN efforts, TRADOC will be able to ensure that the gains made towards Army XXI will migrate both operationally and technologically towards AAN.

JOINT FORCE ORGANIZATION

DBBL's proposed task organization envisions a Joint Task Force Headquarters (based on a Corps HQ) with subordinate Army, Marine, Navy, and SOCOM components.⁵⁸ Since Army XXI and Army After Next forces are inherently intended to operate in a joint context, the idea framing the AWE within a JTF context is right on target. The AAN ideas have clear linkages to the other service future visions and concepts. A joint structure also supports the fundamental that the sponsor would be ACOM and that the forces would come from within ACOM. ACOM has already been heavily supporting ACTDs (of 20 approved ACTDs, ACOM is sponsoring 11); ACOM is already committed to joint training and simulation; and ACOM contains most of the Army's contingency forces. Joint Task Force organizational components can easily be drawn from within ACOM (minus the SOCOM elements).

The selection of Army units within this organization should include consideration of how the AWE products can increase the readiness of the participating units. It would be logical to include elements of the 10th Mountain Division and the 2d Armored Cavalry Regiment because they will be modernized. It would also make sense to include the 101st Division to take advantage of the RFPI systems already provided to the division. However, the 82d Airborne Division should be included to give it access to the new technologies.

ANALYSIS & SIMULATION TIMELINES

TRADOC projects the contingency force AWE for FY 2000 and a Battle Force Group Force XXI experiment for FY 2002.⁵⁹ Given these targets, the following analytical cases tied to timelines are recommended:

1) Current baseline: FY 2002. Models existing force capabilities, actual or projected, including planned system fieldings and organizational changes through 2002. Portrays combat capability without experimental enhancements.

2) Enhanced force: FY 2002. Includes the capabilities from the baseline plus experimental enhancements provided to the AWE for operational assessment. Portrayed through live, virtual, and constructive simulation in the AWE.

3) Army XXI potential force: FY 2010. Projects the evolution and/or proliferation of experimental capabilities

through virtual and constructive simulation. Measures degree of Joint Vision 2010 capabilities achievement as a result of AWE organizations, systems, and experimentation. Enables analysis of a mid-term conflict before the availability of AAN technologies.

4) AAN possible force: FY 2025. Projects the Army XXI capabilities through basic and applied research breakthroughs to provide insights into far-term AAN possibilities. Provides the analytical and simulations linkage from the AWE to the AAN process.

COMBAT FUNCTIONS SCOPE

The ACTDs and other S&T programs have all been focused on specific aspects of combat capability enhancements. However, the AWE needs to include all seven U.S. Army Combat Functions (FM 100-5) -- Maneuver, Fire Support, Mobility & Survivability, Air Defense, Battle Command, and Logistics. Based on available technologies, funding constraints, and user unit input, TRADOC could certainly prioritize the combat functions both for technology insertion and for operational assessment.

SYSTEMS

DBBL has done a preliminary assessment of technologies that can migrate from the S&T community into the AWE. In addition to the systems available from the RFPI ACTD, MOUT ACTD, and DARPA SUO program, the DBBL list includes technology insertions from

numerous other Army S&T programs as well as ongoing acquisition programs. In addition, DBBL has identified the Marine Corps programs that could fit into the AWE. The availability of SOCOM technologies is not explicitly described at this time.⁶⁰

The AWE should ensure that sufficient systems are available to demonstrate the sensor-to-shooter paradigm⁶¹; i.e., that sensors, shooters, and digital C4I categories are adequately represented. Based on the insights from the Joint Venture experiments, the Army and Joint emphasis on Information Dominance, and the criticality of Information Dominance on Force XXI and AAN efforts, it should be established up front that the C4I category will be the main effort of the AWE, with the Sensor and Shooter categories acting as supporting efforts. Experience with units of the XVIII Airborne Corps in the RFPI ACTD have already confirmed this argument. The Infantry School is already exploring contingency force battle command beyond the RFPI ACTD, scheduled for demonstration this summer. Given the JTF concept for the AWE, the C4I systems should span the range of tactical, operational, and strategic as needed for early entry.

The three categories could include three timeline-based subsets:

- 1) Organic systems--Currently in the inventory at the time of the AWE. This correlates to the baseline case for analysis and simulation.

2) Acquisition programs--Systems that will achieve Initial Operational Capability before or by 2010, based on the current Program Objective Memorandum (POM) and Future Years Defense Plan (FYDP). This correlates to the Enhanced Force or Army XXI force cases for analysis and simulation, depending on the availability date.

c) AAN systems--Advanced technology ideas that represent systems that could possibly achieve Initial Operational Capability between 2010 and 2025. This correlates to the AAN possible force for analysis and simulation.

A critical front-end decision is whether the program will include "residuals," systems left behind with the user after the AWE along the lines of the RFPI and MOUT ACTDs. The inclusion of residuals is a critical inducement to long term significant user unit involvement; however, it would also be the critical cost and schedule driver for the AWE. Given the fact that the AWE will be the stated pathway to Army XXI and AAN for the contingency force, every effort should be made to schedule and budget at least a limited number of systems to be left with the units after the AWE, with the following aims in mind:

- 1) Achieve genuine user interest from the beginning to end of the process.

- 2) Provide a mechanism for long-term user feedback to inform the acquisition decision process and program manager evolution of the systems development.

3) Provide limited "go to war" enhancements to the participating contingency force units.

EXPERIMENT STRUCTURE

The AWE concept should be modeled after the two experimental processes already in use by TRADOC organizations:

1) Joint Venture--The terminology, milestones, and organizational structure of the established AWE process is already familiar to the user community as well as materiel developers and contractors.

2) Advanced Concept Technology Demonstrations--The ACTD process has been documented by OSD and included in TRADOC Pam 71-9, Requirements Determination; it is familiar to materiel developers, battle labs, and ACOM.

The demonstration can and should combine the most useful aspects of both processes. Given the intent to utilize the ACTDs as technology feeders and funding sources, it will be useful to compare and merge where necessary the different procedures of the two processes. As already noted, the use of "residuals" in the AWE would be a significant enhancement derived from the ACTD process.

It is worth noting that the Dismounted Battlespace Battle Lab is currently the user joint manager for both the RFPI and MOUT ACTDs. DARPA's SUO program already has links to the MOUT ACTD and

is focused on the early entry forces for which the Infantry School is the proponent.

EXERCISE LINKAGE

The current experiment concepts call for CTC rotations for both the contingency force AWE and the Battle Force Group live experiment. The AWE experimental events should be linked whenever possible to planned Army/joint experiments and exercises, thus reducing costs and smoothly aligning with field unit training cycles.

EXPERIMENT MANAGEMENT

The most critical management decision is whether to use a joint user/developer management concept. Joint Venture AWEs have been approved by the Army Chief of Staff and executed by TRADOC. However, TRADOC has been using joint user/developer management in current ACTDs and has already formalized the ACTD joint management process in TRADOC Pam 71-9. This option is inherently harder to orchestrate than a single TRADOC lead and risks violating unity of command; the weakness of the ACTD joint management process is that no one person is responsible and therefore empowered to resolve the inevitable conflicts. On the other hand, the strength of the ACTD user/developer joint management process is that both are tied at the hip from

beginning to end; TRADOC and AMC must deliver on its portion of the responsibilities for either to be successful.

TRADOC should consider a modified form of both systems. While this AWE must clearly be user led, it would make great sense to get a materiel developer appointed as soon as possible to be the system integrator for the AWE. Previous AWEs have suffered from failure to identify a systems integrator or doing so too late. By aligning an appointed systems integrator from the materiel development community with the TRADOC user lead, the complementary requirements from each could be better integrated from the beginning. Also, given the heavy emphasis on technology insertion from the ACTDs, DARPA, and RDEC programs, it is particularly critical that a detailed coordination mechanism be set up with a wide variety of materiel development agencies; a long-term systems integrator would facilitate this.

The oversight structure issue will come up early in the concept briefs and will have to be resolved before a plan can be staffed and approved. TRADOC will have to consider which materiel developers should be on the oversight groups. While previous AWEs provide some precedent for this, the strong ACTD and DARPA involvement suggest that a greater role for materiel development oversight is warranted, particularly since S&T funding is needed to make this AWE work. The oversight structure should be resolved during the concept brief stage.

TRADOC and DBBL should conduct initial coordination with ACOM and the Marine Corps Combat Developments Command (MCCDC) as soon as possible to refine the purpose & scope of the AWE and to get front-end agreement on the concept. A draft operational concept should be part of the AWE concept agreement. This is a critical prerequisite to detailed plan development. Any difference in concept expectations not resolved early will have long term effects on the efficiency and effectiveness of planning and preparation.

TECHNICAL RISK

This AWE by its nature will have a significant technical risk. A distinction should be made, however, between the systems development risk, C4I integration risk, management risk, and budget risk.

A moderate level of systems development risk is understandable to users, given the attempt to leverage technologies for Force XXI and AAN.

The success of any future Information Dominance program is dependent on C4I integration. The track record of AWEs and multi-system ACTDs can be characterized by integration efforts that lacked an early designated lead, inadequate funding, and slower progress than planned, resulting in last minute integration efforts after the systems have been delivered to the user units.

This program must determine the size and scope of the integration required and begin planning and coordination at the beginning.

The management process cannot afford to be the Achilles Heel of the AWE. No matter how complete the plan, the AWE cannot be successfully executed in front of Army users unless it is managed professionally. Given the difficulties in executing recent AWEs and ACTDs, senior Army leadership is tuned in to the questions of management structure and clear designation of roles and responsibilities. This risk can be reduced significantly by selecting a technical systems integrator now to work with the TRADOC user lead. The necessity of hand picking that person cannot be stressed enough.

AWEs and ACTDs have been underestimated and underbudgeted since their inception. This has exacerbated the above risk areas and resulted in unstable planning of multi-year programs. Obviously, the AWE will be constrained by a finite budget; it is essential that what is attempted is achievable within that finite budget, since advertising a set of products that cannot later be delivered sets up everyone involved for failure in the minds of the people for whom the AWE is intended.

FRONT-END PRODUCTS

Once the concept is agreed to by the participants, it will be necessary to pull together multiple AWE planning products as soon

FRONT-END PRODUCTS

Once the concept is agreed to by the participants, it will be necessary to pull together multiple AWE planning products as soon as possible to frame the planning and preparation effort. The products discussed below are essential to the success of the AWE.

DEMONSTRATION PLAN

The structure and products to be included in the demo plan should be established during concept development. This will ensure that each product is assigned and suspended to a specific agency. Some examples of formats that are available as precedents include:

- 1) ACTD Management Plan format, as established by OSD.
- 2) Demonstration and Evaluation Master Plan, an ACTD spin-off of the Test and Evaluation Master Plan used in formal acquisition programs.
- 3) AWE Experiment Plan format, used in the recent TF XXI and Division XXI AWEs.

USER PRODUCTS

The following products should be developed by the user lead:

- 1) Requirements Assessment--An initial review of the TRADOC Future Operational Capabilities list and current approved requirements is necessary to establish the link between the

systems and capabilities under consideration and the requirements established by TRADOC.

2) Assessment of previous and ongoing AWEs and ACTDs--DBBL has already conducted a preliminary assessment of the systems available from other programs. The next assessment, to be conducted with the ASTWG, must ensure that a thorough evaluation is conducted to cover all potential technology feeds. It is also important that TRADOC conduct a review across branches to ensure that all potential doctrine, training, organization, materiel, and soldier issues are identified and prioritized for evaluation. Given the limits of funding, it is necessary to avoid repeating past accomplishments or failures; part of the review process should weed out initiatives that have already been evaluated in previous programs and do not add value to the system of systems.

3) Concepts Search--It will be necessary to develop a substantive Organizational and Operational Concept to guide analysis & simulation and to provide the materiel development community a context for their systems efforts. This will be a difficult product to produce and on which to achieve consensus, yet it is the critical prerequisite to getting all participants on a common path towards an identifiable force structure and fighting concept. The related concepts of the other services for 2010-2025 should be assessed and integrated as appropriate. Of course, the concept can and should be updated based on the

insights gained from analysis, simulations, and user unit review and experience.

4) Scenarios--DBBL has already identified four scenarios in the current concept brief.⁶² Next to concepts and systems, the scenarios selected will most clearly define the context of the early analysis and the eventual demonstration. It is essential that the operational context in which the systems are to be employed be defined in sufficient detail by the user so that a finite number of scenarios can be selected. These scenarios must then be compared to existing and scheduled Defense Planning Guidance scenarios to determine how many are close enough to be utilized, which will establish the number of new scenarios that will have to be developed and certified. Given the lead time necessary to produce new scenarios, the size of this effort must be determined early.

5) Operational Architecture--Operational Architecture drives System Architecture; it is critical that an initial OA be constructed to tie together the concepts, organizations, and systems to be used in the scenarios. While the user units involved will not be prepared to pin this down in the early stages, it is essential that a strawman be developed by the TRADOC lead to ensure that the systems integrator can develop the systems architecture in parallel. An early consensus on OA and SA between user and developer is essential to keep the systems development on schedule.

DEVELOPER PRODUCTS

1) Initial Systems list--The available/proposed systems to be offered to the user is the first critical developer product. The above listed user products cannot be effectively produced without some understanding of the types of systems that frame the advanced technology categories.

2) Schedule inputs--The systems integrator needs to develop and coordinate the systems integration and delivery schedules to support the AWE timeline. This process requires user coordination and concurrence. A list of key timeline items which must be deconflicted with the developer schedules is listed in the Timeline section.

ANALYSIS & EVALUATION PRODUCTS & DECISIONS

1) Organizations--The organizations to provide analysis and evaluation must be brought in from the beginning to ensure that the issues to be evaluated and the evaluation process are worked in parallel with the users and developers. Based on previous AWE and ACTD experience, the following agencies should be brought in at the beginning:

a) Operational Test and Evaluation Command (OPTEC); lead for operational assessment.

b) TRADOC Analysis Command (TRAC); lead for analysis.

c) Army Materiel Systems Analysis Agency; lead for accreditation of systems data for analysis and simulations.

d) Test and Evaluation Command (those portions not merged with OPTEC); lead for technical systems evaluation.

e) OSD Red Team; lead for countermeasures assessment. The specific role of this agency should be negotiated up front.

2) Analysis issues--The objectives that govern the demonstration, once drafted by the user/developer team, must be stratified into Issues, Criteria, MOEs, MOPs, Data Requirements, and Data Elements.

3) Training Effectiveness Analysis--A decision on the utility of conducting a Training Effectiveness Analysis must be made early, given the lead time necessary to get TRADOC funding approval.

TIMELINE

The initial schedule needs to contain sufficient detail to ensure that all parties can conduct long-range planning. Specifically, the following items should be included in the initial version, if known, even with tentative dates:

- 1) Individual systems demonstration dates.
- 2) Small scale supporting experiment milestones.
- 3) Parallel experiment key dates (related AWEs & ACTDs).

- 4) Analysis & Simulation events.
- 5) Instrumentation and data collection development
(including real/virtual integration to link the live systems with the supporting demo simulation).
- 6) C4I Integration schedule.
- 7) Equipment delivery schedule.
- 8) Everything in place date.
- 9) New Equipment Training and unit trainup (including training development milestones).
- 10) Demonstration rehearsal dates.
- 11) Primary AWE date(s).
- 12) Post-AWE report milestones.
- 13) Known or likely acquisition decision points.

CONCLUSIONS

The strategic reviews of the last few years have confirmed the necessity of an increasingly capable future contingency force. TRADOC's Force XXI and Army After Next programs emphasize the criticality of this capability in the Army's future warfighting concepts. Yet the contingency forces are lagging behind in modernization.

The Department of Defense and Army leadership recognize that modernization funding has been secondary to current readiness during the recent years of the drawdown. The leadership recognizes that modernization funding must be a priority in the future. Yet modernization funding is significantly below the

level that is required to achieve the capabilities described in our strategy and vision documents. This shortfall is particularly acute in the contingency forces, despite a focus on contingency capability by the Army's Science & Technology programs.

TRADOC's proposed contingency force AWE provides an ideal opportunity to close the gap between heavy and contingency forces. By leveraging and focusing existing S&T programs in a near-term effort, TRADOC can have an immediate and lasting impact not only on the modernization of contingency forces but on the evolution towards Army XXI and Army After Next as well. If the current concept for the AWE can be matured into a scheduled and funded plan, the Army will have its best opportunity at solving the contingency force modernization problem. Given the criticality of contingency forces in the future, it is imperative that this AWE go forward.

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