STUDY PROJECT

PROJECT RELIANCE DoD'S RDA MANAGEMENT TOOL FOR THE TWENTY-FIRST CENTURY

BY

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USAWC MILITARY STUDIES PROGRAM PAPER

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DoD'S RDA MANAGEMENT TOOL FOR THE TWENTY-FIRST CENTURY

AN INDIVIDUAL STUDY PROJECT

by

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INTRODUCTION

The 1993 U.S. National Security Strategy (NSS) states the importance of maintaining an aggressive technology policy:

> The National Security Strategy of the United States has long depended upon technological superiority to counter the military numerical superiority of its potential adversaries. But carrying out this strategy has its price: the United States must stay technologically ahead of its potential adversaries. And it must do so during a time of unprecedented technology advances around the globe.[1]

Desert Storm convinced our leaders that technology was capable of bringing about decisive results quickly, while saving lives, minimizing collateral damage and reducing force structure requirements. Other nations, however, also witnessed the importance of technology as a force multiplier. It can be expected that they will either invest heavily in technology or buy it off the shelf from one of the many aggressive and competent international arms dealers in the marketplace. Consequently, the United States can not afford to fall behind in technology advancements, if it hopes to remain a world leader.

The NSS also lists economics as another reason for the importance of technology. Specifically, it states:

> America's longer term economic position in the world will be determined by how well we succeed in ... ensuring our lead in the crucial technologies of a new era; ...At home, our long-term growth strategy must include: ... increased investment, particularly in research and development.[2]

This view of the importance of technology to the economy is not new. In the Brookings Institution Report The Technology Pork Barrel it is written:

> American public policy has a long history of technological optimism: a belief that "technological growth will ... expand resources ahead of exponentially increasing demands." The historical economic and military success of the United States forms the basis for America's technological optimism... Likewise, the success of the United States in all-out wars and its freedom from devastation of modern warfare contribute to optimism about technological advances in weaponry.[3]

Technology growth is important to both continued military and economic strength, with the Department of Defense (DoD) as one of the most significant consumers of technology in this nation and the world.[4] DoD is also very effective in bringing new technology to fruition. Through the proper seeding of research and development dollars into critical dual-use technologies, DoD is able to reduce unit costs, maintain the U.S.'s technological superiority, and assist key industries in remaining both competitive and in the United States.

The purpose of this paper is to examine the Project Reliance Program as a management tool used by DoD's Research, Development and Acquisition (RDA) program for maintaining the United States' technological edge into the twenty-first century. I will review significant historical events in DoD's RDA programs since 1986 to include: the Goldwater-Nichols Act, and the National Security Decision Directive (NSDD) 219. Proposals for the government to assist industry will be discussed especially in the area of dual-use technologies which have both military and commercial applications. A new technology, high density flat panel displays, case study will demonstrate the application of Project Reliance to a specific program and discuss the advantages and disadvantages. Finally conclusions and recommendations will be made.

HISTORICAL REVIEW

It is recognized that an aggressive research and development program is needed to maintain the U.S.'s technological edge as well as to retain our current preeminent military and economic position. In support of NSS, the National Military Strategy (NMS) reads:

> ...the United States must continue to rely heavily on technological superiority to offset quantitative advantages, to minimize risk to U.S. forces, and to enhance the potential for swift, decisive termination of conflict. In peace, technological superiority is a key element of deterrence. In war, it enhances combat effectiveness and reduces loss of personnel and equipment. Our collective defeat of Iraq clearly demonstrates the need for a superior intelligence capability and the world's best weapons and supporting systems. We must continue to maintain our qualitative edge. Therefore, advancement in and protection of technology is a national security obligation.[5]

The Department of Defense's new strategy approach for technology development is shifting emphasis to a capability-based strategy based on power projection and deterrence. This strategy shift will be constrained by reduced defense budgets, limited forward basing, minimal casualties, and a smaller base force. It will be necessary, however, to maintain a rapid deployment capability, high fire power and a defense against weapons of mass destruction.[6] In developing this strategy, former Secretary of Defense Cheney advised:

> The end of the Soviet threat....(suggests) that we will be able to slow down our modernization efforts and still maintain our technological edge.... This enables us to cancel some modernization efforts and to emphasize longer periods for research and development and for testing and proving the value of systems before buying. Accordingly, DoD has instituted a new acquisition strategy.
>
> ... Under the new U.S. acquisition strategy, there will be heavy emphasis on government-supported R&D to maintain the technology base. More work will be done with prototypes to demonstrate capabilities and prove out concepts. We plan to go to (production) on fewer systems, and only after having taken the time to prove out the concept. We will rely more often on inserting new capabilities into existing platforms and upgrades, instead of building totally new systems. We will also place greater emphasis on producability of systems and manufacturing processes.[7]

Let us now look at how DoD's RDA strategy is being implemented not only to maintain our technological edge but also insure that it meets the requirements of the warfighters.

Past Practices

In the past each service, the Army, the Navy, the Marine Corps, and the Air Force, conducted research more or less independently with industry except for such Department of Defense organizations as the Advanced Research Planning Agency (ARPA). The result of this policy meant that the Department of Defense paid several times over for the same technology. In addition, the equipment for each service was configured differently. During joint operations and exercises the services found their equipment was not interoperable and the parts were not interchangeable.

Materiel acquisition has became more complex. The Chief of Staff of the Army noted at the 1987 Association of the United States Army (AUSA) convention that weapon systems technology was advancing so quickly that the acquisition process took longer than it took to develop a new technology. Consequently, the Army was in danger of fielding equipment which was obsolete even before it reached the hands of troops. The bureaucratic structure had too many layers.[8]

As a result of this extensive layering and other perceived problems, the Congress, in 1986, passed the Goldwater-Nichols Department of Defense Reorganization Act. This act impacted greatly on the entire Department of Defense, and constituted one of the most important and far reaching pieces of defense legislation enacted in the last three decades. The follow on National Security Decision Directive (NSDD) 219 directed specific changes to the overall defense research, development, and acquisition system. NSDD 219 directed the Services to:

- o Appoint full-time Service Acquisition Executives (SAE) to administer acquisition programs.
- o Appoint Program Executive Officers (PEO) responsible for a defined reasonable number of programs.
- o Direct that Program Managers (PM) report on programs directly to a PEO (or the SAE)
- o Establish no more than one level of program supervision between a PM and the SAE, and not more than two levels between the PM and the Defense Acquisition Executive (DAE).[9]

In 1992, the Director of Defense Research and Engineering (DDR&E) formulated a new Science and Technology (S&T) strategy.

Even with recent changes in the administration, this strategy remains current. The core of the strategy is based on three concepts: (1) provide for early, intensive, and continued involvement of warfighters; (2) fund and exploit the information technology explosion; and (3) conduct extensive technology demonstrations. To provide focus on the most pressing military and operational requirements Seven "S&T Thrusts" were selected rather than trying to "balance" across all possible investment options.[10]

A key element in the S&T strategy identified in the first concept is the early involvement of the warfighters in technology development. The strategy stresses the importance of feedback from the warfighters to the materiel developers on concepts, doctrines, and military needs. It also stresses the "feed forward loop" to the warfighter by allowing them to operate the new technology on a synthetic battlefield. The feedforward and feedback loops take place on expanded and integrated instrumented training ranges and electronic battlefields. These synthetic environments are networked throughout the scientific and development communities to enable the combat and materiel developers, scientists, behavioral psychologists, engineers, manufacturers, and warfighters to address and solve their most pressing problems early in the development process, before production decisions are made. This ensures warfighter needs are met without incorporating unnecessary characteristics, otherwise known as "gold plating."[11]

The second concept of the S&T strategy, providing funding and exploiting the technology explosion, is achieved by tying new, innovative technology to military requirements. For instance, in the 1940s and 50s computers were primarily developed to meet military requirements. Today the exponential increase in speed, capacity and computational power of computers permits larger and more complicated tasks to be accomplished faster and with smaller margins of error. Continual reevaluation of military requirements enables the military R&D community to incorporate these significant design improvements in more affordable systems. The result has been the creation of more effective command, control, communications and intelligence (C3I) structures, thus insuring our forces are more capable than any potential adversary.[12]

The third concept, use of the Advanced Technology Demonstration (ATD), ensures that the technology is ready, the manufacturing processes are available, operational concepts are understood and effective before the formal acquisition process is initiated. These ATD's take place in a synthetic battlefield environment with advanced simulation techniques creating as realistic operating conditions as possible. While demonstrating the capability of the technology, comprehensive assessments of technological feasibility, affordability, and operational utility are made. Although technological demonstrations are not new to the military, the scope and depth of the demonstrations, their central position in the acquisition process, and the emphasis on ultimately demonstrating useful military capabilities has been greatly expanded.[13]

The S&T program is focused on seven broad areas of capability. These areas were selected to support the ne s identified earlier to minimize casualties, accommodate a smaller force structure, improve joint operations, retain the edge against all potential threats and support the user's most pressing military and operational requirements. The Seven Thrusts are:

1. **Global Surveillance and Communications.** The ability to project power requires a global surveillance and communications capability that can focus on a trouble spot, surge in capacity, and respond to the needs of the commander.

2. **Precision Strike.** The desire for reduced casualties, economy of force, and fewer weapons platforms demands that we locate high-value, time-sensitive fixed and mobile targets and destroy them with a high degree of confidence within tactically useful timelines.

3. **Air Superiority and Defense.** The need to defend deployed military forces from aircraft and ballistic and cruise missiles, and to maintain our current decisive capabilities in air combat, interdiction, and close air support, requires a strong effort in missile defense and air superiority.

4. **Sea Control and Undersea Superiority.** The need to maintain overseas presence, conduct forcible entry and naval interdiction operations, and operate in littoral zones presupposes strong capability in sea control and undersea warfare.

5. **Advanced Land Combat.** The ability to rapidly deploy our ground forces to a region, exercise a high degree of tactical mobility, and overwhelm the enemy quickly and with minimal casualties in the presence of a heavy armored threat and smart weaponry requires highly capable land combat systems.

6. **Synthetic Environments.** A broad range of information and human interaction technologies must be developed to synthesize present and future battlefields. We therefore must synthesize factory-to-battlefield environments with a mix of real and simulated objects and make them accessible from widely dispersed locations. Integrated teams of users, developers, and/or testers will be able to interact effectively. Synthetic environments will prepare our leaders and forces for war and will go with them to the real battlefield.

7. **Technology for Affordability.** Technologies that reduce unit and life cycle costs are essential to achieving significant performance and affordability improvements. Advances are particularly needed in technologies to support integrated product and process design, flexible manufacturing systems that decouple cost from volume, enterprise-wide information systems that improve program control and reduce overhead costs, and integrated software engineering environments.[14]

Within each Thrust, specific ATD's are being identified that meet the goals of the Thrust.

The overall goal of the Thrusts is to ensure the availability and integration of advanced technologies to meet military needs. To accomplish this overall goal, the management philosophy is to meet the needs of the customer by "requirements pull" while at the same time making available the latest technologies to meet pressing operational requirements by "technology push."[15]

Due to the changing world situation, the Goldwater-Nichols Act, NSDD 219, and declining RDA budgets, the Department of Defense realized it needed to determine if its organizational structure and means of doing research were still appropriate for the strategic environment of the 1990s. In October 1989, a cooperative study was undertaken by the Army, Navy and Air Force to determine ways to strengthen inter-service cooperation in their RDT&E programs and to increase utilization of each other's facilities. This study, the Tri-service Science & Technology Reliance Project, was designed to examine opportunities to consolidate and collocate R&D efforts at single site locations in selected technology areas. In November 1990, The Deputy Secretary for Defense signed Defense Management Report Directive (DMRD) 922 which formally acknowledged savings already achieved by individual service initiatives and adopted the Tri-service S&T Reliance initiative. DMRD 922 also tasked the services to proceed with plans for structuring and streamlining their RDT&E activities to support Project Reliance. By November 1991, all three service assistant secretaries for Research, Development, and Acquisition had reviewed the study and directed implementation for their respective services. In addition, responsibility for carrying out implementation and verification of compliance with Project Reliance was assigned to four bodies: the Joint Directors of Laboratories; the Armed Services Biomedical Research, Evaluation, and Management Committee; the Training and Personnel Systems Science and Technology Evaluation and Management Committee; and the Joint Engineers.[16]

PROJECT RELIANCE

Project Reliance is one of the most comprehensive restructuring efforts involving the science and technology base in over 40 years. The goals of S&T Reliance are formally stated as:

- o Enhance science and technology
- o Ensure critical mass of resources to develop "world-class" products
- o Reduce redundant capabilities and eliminate unwarranted duplication
- o Gain efficiency through collocation and consolidation of in-house work where appropriate; and
- o Preserve services' mission-essential capabilities.[17]

Project Reliance provides a framework for integrating research in the Department of Defense into six categories:

1. **Coordination.** This category represents the type of interaction most frequently used among the services prior to Reliance. For example, it would literally describe hundreds of DoD-sponsored S&T coordination bodies that had successfully supported S&T coordination for the past several decades.

2. **Joint Efforts.** This category includes programs that will be planned and conducted jointly, but task execution can be at separate service locations and all services retain separate funding control.

3. **Collocation.** This category includes programs for which in-house task execution will be collocated at a single services' activities, with all services retaining separate funding control. Each service at its option, may retain its own in-house effort of up to two work-years per year, in order to ensure service awareness of the major activity on-going at the collocated site. Collocated programs may also be "joint," but there is no requirement for this.

4. Consolidation. This category includes programs that will consolidate under a lead service for management. For programs so designated, all related S&T funds will be transferred to the designated lead service, and work will be carried out at that service's activities.

5. Competition. This category includes programs for which in-house task execution will be competed among the service performers, with all services retaining separate funding and performer-decision control.

6. Service Unique. This category recognizes that certain S&T programs will be unique to a given service, for which the other two services have no need to rely on that service.[18]

The objective of Project Reliance is to move, whenever feasible, the preponderance of the Services' Category One activities into either Categories Two, Three or Four. This is a major step in promoting jointness in research and development, but without forcing the "one solution fits all missions" mistakes of the McNamara era. Two hundred and twenty eight different technology topics were selected and reviewed and appropriate higher levels of interservice Reliance categories were proposed when the topic was not considered service unique. Out of 171 topics originally in category One only one topic remained in Category One.[19]

Managing technology development is dynamic and other government organizations outside of the three services are involved. The notion of "leveraging" is used since no one organization can fund all of its projects, but they can cost share in projects where several agencies have an interest. Organizations that are involved in the Project Reliance program include: ARPA, the Strategic Defense Initiative Organization, the

National Aeronautics and Space Administration, the U.S. Special Operations Command, the National Security Agency, and the Federal Aviation Administration.[20]

The Project Reliance program also recognizes the contributions that private industry gives to government R&D. Many companies have been willing to engage in the development of new technologies that were some what risky because they were financed with government funds and the promise of production profits and commercial spin off products.

Project Reliance managers recognized that although military requirements could not be unnecessarily compromised, commercial and military specifications needed to be integrated as much as possible to permit rapid commercial spinoffs and to avoid unnecessary "goldplating." They wanted to get corporations to reinvest in further research and development to improve the commercial product, while also remaining cognizant of military requirements. Ideally, the military would benefit as the product was upgraded using commercial research and development dollars.

While once there were many firms interested in contracting with DoD, there are less today for several reasons: declining RDA budgets, announcements that technology will be developed but not fielded, special regulations and military specifications, and rules on bidding and executing government projects. With the reduction in DoD's RDA dollars, many businesses are less likely to be interested in dealing with the government. Businesses will be less inclined to spend their own research money or manpower to develop military unique hardware unless potential civilian consumer products can spin off to help the corporate profit picture.

Senator Jeff Bingaman, D-NM introduced $535.5 million dollars in high-tech research initiatives into the 1992 defense authorization bill to "dual-use" technologies that would have application for commercial development as well as defense. The bill also required the department to work more closely with industry. DoD was directed to draw a roadmap for research and development of 22 crucial technologies which had previously been identified by the Bush Administration as critical technologies. While some committee members criticized the program as peripheral to DoD interests, the proposal drew praise from a number of industry leaders.[21]

Using the small High Density Flat Panel Display Technology, one of the critical technologies identified, we will examine how the management concept of Project Reliance can be used in developing new technologies.

CASE STUDY

The electronic display has become almost indispensable in the modern world. It provides information in any combination of text, graphics, still images or video. The conventional Cathode Ray Tube (CRT) still remains the dominant display; but, it is difficult to modify for portability, and minimize power requirements while producing a superior image. Attempts to squash the CRT into a flat panel have led to inferior picture quality and complex designs with excessive cost. Recent advances in microelectronics, and liquid crystals allow for flat, light weight, low volume, and low power screens with incredibly high potential resolution. Earlier versions of such devices have been on portable computers for several years. One particular technology, the active-matrix liquid-crystal display (LCD) corrects many of the problems of earlier models and surpasses the resolution of the CRT.[22]

The U.S., Europe, and Japan had been competing to develop LCD technology. While the U.S. had originally developed liquid crystals, Japan was able to capture the market by better manufacturing technology and aggressive marketing. Japan also was trying to improve display technology with higher resolution displays (High Definition TV). One firm had spent over $1 billion to develop a High Definition Television (TV). The Europeans and the U.S. realized that the Japanese could not be allowed to monopolize such an important field. The Europeans following the Japanese lead, invested in an analogue system which showed only modest improvements.

In the U.S., the Federal Communications Commission (FCC) launched a world wide competition with the promise that the best technology would become the new U.S. industry standard. Alfred Sikes wrote in the Wall Street Journal:

> In Digital Advanced Television (DATV) sound and picture are converted to digits, sent along compressed

> transmission paths and then almost simultaneously stored, processed and converted for presentation to the viewer.[23]

In testimony before Senate Committee on Commerce, Science and Transportation, in June 1989, the Vice-President for the American Electronics Association stated:

> Advanced Television (AT) has been identified as one of the critical emerging technologies that will have a significant impact on the long-term economic health and competitiveness of the U.S....AT is a fundamental imaging technology...spin off markets are many and varied...medical imaging, telecommunications, printing and publishing, military and space, office and industrial, and public (Education/Air Traffic Control)...this is a technology with long-term and far reaching competitive implications. It offers the U.S. a once-in-a-lifetime gateway to bolster our present lead in computers and telecommunications as well as position us to manufacture a variety of new end-use products. New market opportunities from AT technologies and their many spin-off products are expected conservatively to total $20 Billion by the year 2000.[24]

In Nov 1992 the Washington Post reported:

> The United States is preparing to rejoin a major technological battle with Japan that many thought it had lost. Early next year, more than a dozen U.S. companies plan to propose a partnership with the Department of Defense to overtake Japan's lead in the manufacture of the thin electronic screens that will be a crucial component in the multibillion-dollar market for future laptop computers, weapons systems and high-definition television sets, industry sources said.[25]

Why would such a technology be considered so significant? These small, high density flat panel displays depict large amounts of information; and, because of high resolution, they can be held close to the eye without the grainy look of current technology. The displays can be in color and potentially in three dimensions with the same resolution of current super Video

Graphics Adaptor (VGA) color monitors used with computers. Individuals would be able to see maps, operations orders with overlays, diagrams, schematics, and photographs.

A potential military application would be a helmet mounted display for use by aviators (fixed and rotary wing), combat vehicle crewmen, and even infantrymen. Current helmet mounted displays worn by pilots of fighter planes and advanced attack helicopters use small CRT technology. These tubes are relatively heavy (weigh three to four pounds), expensive ($5000-$10,000), complex and delicate (20-50 mirrors) and must be recalibrated frequently. On the contrary, the new flat panel displays have the potential to weigh less than a pound and cost less than $1000 each. Weight and cost would be reduced by replacing glass optical components with plastic diffraction gratings and liquid crystal panels. This would make the displays more rugged and require less frequent adjustments caused by temperature changes and vibration.

Another significant application is "virtual reality training." Soldiers wearing these devices could be placed into synthetic combat environments of portraying possible combat scenarios; and they would be able to exercise options similar to current Simulation Networking (SIMNET) simulators. Investigations are planned to see if actual equipment rather than simulators could be used to heighten realism and fidelity of training under certain conditions.

Besides military applications this technology has many potential civilian applications cited by the manufacturers. These include lightweight monitors for computers, television medical imaging and security equipment and a variety of gaming and entertainment devices. Peter Mills, an industry consultant who chaired several industry meetings on this technology stated:

> This industry has the potential to be the kind of technology driver for the electronics industry that semiconductors were in the 1970's and 1980's ... To rely on foreign sources for a technology as critical as this one is something that concerns all of us.[26]

ARPA has teamed with representatives from the Army, Navy, Air Force, and other government agencies to develop LCD technology. They are using the Project Reliance initiative as their management blueprint. Three working groups composed of multiple service and federal agency representatives were assigned to look at large, medium, and small flat panel displays. While the media has focused more attention on the large displays, it is my opinion that the large displays will be very expensive and have limited military application and be used principally in the civilian sector for entertainment purposes. Therefore, I will restrict my case study to a discussion of the small flat panel displays, because it appears to have wider military application.[27]

After looking at a number of proposals, the working group selected a consortia of U.S. businesses to develop a small high density flat panel display with nominal dimensions of approximately one inch by one inch. In 1992 ARPA funded this consortia with twelve million dollars to produce laboratory prototypes within two years. The prototypes, provided to each service for experimentation and evaluation, will be integrated into existing or prototype helmet systems for use in simulation or field testing as an Advanced Technology Demonstration (ATD). This method preserves a service's mission essential capabilities but gains efficiency by being consolidated under a lead agency. Characteristics and specifications, agreed on by the initial working group, provide each service the minimum performance levels it needs; but, parts and maintenance are to be common to all agencies. The program falls into Category Four of the Project Reliance framework with the Army Research Laboratory as the lead agency at the present time.[28]

Advantages

Project Reliance will help DOD manage its R&D dollars better by reducing the amount of duplicate research in the same technology, as witnessed in the case study. Using DoD funds to support higher risk technology or to share R&D costs will help civilian industries to remain competitive, especially in global markets.

Congress is more likely to support DoD with additional funding if DoD demonstrates jointness by having the services co-operate instead of competing. In addition, DoD must work with key defense industries, industry consultants, universities and other agencies and pursue dual-use technologies. There appears to be support and understanding that unless the federal government co-operates with industry to fund research in the high technology area, these industries will not be able to compete on the world market. Project Reliance offers hope by eliminating the objections of service parochialism and creates a bigger base with greater profit potential for business and less overall cost for DoD.

Project Reliance allows for the pursuit of service unique requirements and development of equipment. It also encourages a freer exchange of information and ideas and permits services to monitor other services' products so that an awareness of capabilities and limitations in the technology are known and considered throughout the life cycle.

Disadvantages

Project Reliance may tend to force the individual services to make so many tradeoffs so early that the outcome is too compromised and does not reflect the original requirement and a suboptimal product is fielded.

Conservative politicians are reluctant to have the government fund research and development because

> they constitute industrial policy that interferes with the free market... defense budgets are declining sharply... yet each year we direct the Department of Defense to finance programs which are often only peripherally related to the Department's primary mission of defending the nation.[29]

Conservatives believe that market forces are more efficient in driving innovations. When a risky research initiative fails, only the business suffers, not the taxpayer. The collapse of the Soviet Union illustrates how government control of industry and research can ultimately bankrupt a nation. I believe, however, there is a middle ground where government can provide seed money to influence research and development of dual-use technologies without driving business and the nation bankrupt. The purpose is not only to advance military technologies needs but also to support the military industrial base. At the same time industry insures that technology remains attractive and meets civilian consumer needs.

Government funded research can and does fund losers. The wrong technology may be selected or the packaging may be inappropriate. Japan and the European Economic community have spent over one billion dollars each to fund high definition T.V. This technology has already been eclipsed by digital T.V. In the United States programs such as:B-1B, A-12, DIVAD and Tacit Rainbow were funded for the military and failed. These programs were examples of incremental improvements in technology wasting badly needed resources on undeployable and unaffordable systems. With the end of the Cold War, there is more time and less risk in fielding new systems; but, there is also less money available.[30]

Funding technology is not a panacea. DoD should only fund those technologies which enable systems to provide a combat multiplier. It is equally important that new technology be properly introduced and fielded, with all the ramifications of Training, Doctrine, Logistic and Organizational implications.

> Technology must be tied to a systematic appraisal of every aspect of force effectiveness, and to the understanding that every dollar spent on technology means the sacrifice of some other aspect of deterrent and war fighting capability. [31]

Any appraisal of new technology must consider commercial applications. Dual-use technologies help to reduce R&D costs; and, continued improvements, which are expected in the civilian sector, prevents the technology from becoming outmoded as quickly. Outmoded systems are difficult or impossible to fix or replace because industry shuts down the production lines. A shrinking procurement budget no longer allows DoD the luxary of keeping a production line warm by extending the buy on a particular weapon system.

CONCLUSIONS AND RECOMENDATIONS

While our national strategy does not hinge on technology alone, we can ill afford to discount technology, especially when we already concede numerical advantages to potential aggressors. The current military strategy which has technological superiority as a fundamental concept is valid; but, in the era of declining resources it will not be easy to sustain. Project Reliance will provide a management tool to make technology as current and affordable as possible.

DoD's S&T Trusts approach takes advantage of key technologies which the United States either should have or does have an advantage. Consolidation of our technology base in the Project Reliance program allows diversity when there is merit while reducing or eliminating duplication in research efforts. The key is not a new bureaucratic structure but the free flow of information and assistance across services and agencies without petty rivalry. Project Reliance appears to be a major step in the right direction.

As continuing budget cuts reduce force structure, DoD must constructively argue that any savings should be used for R&D to offset the loss in force structure. Critical dual-use technologies offer considerable advantages because they not only help the economy and U.S. industry but they help insure that our soldiers, sailors, and airmen are still the best equipped military forces in the world. Besides improving military capabilities they offer the potential to cut costs. Further, if the government intends to assist industry in maintaining the technological edge, then industry should consider military as well as civilian applications. This is especially true because commercial industries' interest in military applications for technology has waned due to announced procurement reductions.

Leading edge technologies must be examined both from the aspect of what value they provide the soldier (military consumer) as well as the potential civilian consumer. Military requirements must be carefully evaluated in conjunction with possible commercial applications. Compromise or some limitations in performance of new equipment in the short term should be considered if it enhances commercial success. In the long term commercial success and competition can provide successive generations of improved technology at lower unit prices for both the military and civilian consumer. Research and Development should focus on military needs but whenever and wherever possible must consider global economics and commercial potential as an avenue for cutting cost.

The Department of Defense should actively work with other executive agencies and Congress to obtain greater funding for Research and Development in critical dual-use technologies. The Department of Defense would assist in drawing up potential applications and testing the products. The Government would help fund new research for the highest payoff dual-use technologies with industry with the understanding that industry would retain reasonable military specifications in successive generations, which should result in lower unit production costs.

Services must co-operate in determining requirements for new technology so that the Department of Defense can negotiate from strength rather than paying multiple times for essentially the same technology. Whenever feasible and practical other agency needs and requirements should be solicited if cost sharing and ultimate cost savings are anticipated. Continued development and refinement of Project Reliance is advocated.

ENDNOTES

[1]George T. Singley III and Douglas E. Ellsworth, "Tri-Service Reliance in Science and Technology," Army Research Development & Acquisition Bulletin, (November-December 1992), 2.

[2]White House. 1993 National Security Strategy of The United States., (Washington D.C.: U.S. Government Printing Office, January, 1993), 10.

[3]Linda R. Cohen & Roger G. Noll, The Technology Pork Barrel (Washington, D.C.: The Brookings Institution, 1991), 1.

[4]Technology has a major impact on both economics and military capabilities. Some examples in history are the Roman Road net which was critical for the rapid movement of Roman Legions to any point of crisis in the Empire but also allowed commerce to flow throughout the Roman Empire. The development of the railroad in the nineteenth century was important to the development of industry but also permitted mobilization and replenishment of large armies. The invention of the combustion engine and radio were key to the construction of the airplane and tank. When employed together "blitzkrieg" overcame the static warfare caused by the machine gun and barbed wire. The transistor and further integration of chip technology has made computers, night vision and precision guidance technology possible. The War in The Gulf demonstrated again that technology in the hands of a well trained and led Army can be used to win wars, while reducing unnecessary military and civilian casualties, limiting collateral damage, and protecting vital interests such as the free flow of oil at market prices. But technology does not stand still and training to fight the last war will not win the next.

[5]Department of Defense, National Military Strategy of the United States, January 1992, 10.

[6]Department of Defense, Director of Defense Research and Engineering, Defense Science and Technology Strategy, (July 1992), I-6.

[7]Ibid, I-8.

[8]Col Robert B. Tinsman ed. Army Command and Management Theory and Practice, A Reference Text for Department of Command, Leadership, and Management 1991-1992. (Carlisle Barracks, PA: U.S. Army War College, 1991), 17-12.

[9] U.S. Army War College, Army Command and Management, Theory and Practice, 1991-1992, 17-3.

[10] Director of Defense Research and Engineering, Defense Science and Technology Strategy (July 1992), ES-1,ES-3.

[11]Ibid, ES-1.

[12]Ibid, ES-2, I-14.

[13]Ibid.

[14]Ibid, I-18.

[15]Ibid, ES-3, ES-5.

[16]Singley and Ellsworth, 4-6.

[17]Ibid, 4.

[18]Ibid, 4.

[19]Ibid, 4.

[20]Ibid, 4.

[21]Alissa J.Rubin, Congressional Quarterly."Bingaman's High-Tech Plan." Vol 49, No. 30 (27 July 1991), 2090.

[22]Stephen W. Depp and Webster Howard, "Flat-Panel Displays; Recent Advances in microelectronic and liquid crystals make possible video screens that can be hung on a wall or worn on a wrist", Scientific American Vol 268, No. 3 (March 1993), 90.

[23]Alfred C.Sikes, "Bureaucrats, Don't Touch that Dial." The Wall Street Journal, 23 January 1993, sec. A, p. 16.

[24]Congress, Senate, Committee on Commerce, Science and Transportation, Department of Commerce Technology Programs Authorization, 101st Cong., S. HRG 101-565, 110-111.

[25]Southerland, B1.

[26]Ibid, B4.

[27]I was a member of the small displays working group and my opinions are based on what I read and heard while a member.

[28]Ibid, B4.

[29]Rubin, 2090.

[30] Anthony H. Cordesman, Compensating For Smaller Forces: Adjusting Ways And Means Through Technology (Carlisle, PA.: Strategic Studies Institute, 1992), 9.

[31]Ibid, 8.

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