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INTRODUCTION

Mr. Chairman and Members of the Committee, thank you for the opportunity to appear before you to discuss Army modernization and the President's budget request for Fiscal Year 2000 (FY00). It is a privilege for me to represent the Army leadership, the civilian and military members of the Army acquisition workforce, and, most importantly, the soldiers who rely on us to provide them with world-class weapons and equipment to fight and win our nation's wars.

America's Army is the finest land combat force on earth. We are very proud of our soldiers and what they accomplish every day in countries all over the world. We thank you for your help and support in equipping them to do their jobs. As representatives of the American people, you have strongly supported our programs and guided them to fruition.

It is imperative that we sustain modernization. If not, our technological advantage over potential adversaries will diminish over time and increase the risk to our soldiers. Continuous modernization is one of the keys to dominance on the future battlefield and the key to readiness for unexpected challenges of the 21st Century.

ARMY MODERNIZATION AND THE NATIONAL MILITARY STRATEGY

America's Army is supporting the National Military Strategy (NMS) around the world, 24 hours a day. In the last decade, the American soldier has shouldered much of the responsibility for **shaping** the geostrategic environment consistent with our national interests and values. Throughout the world, our forces are keeping the peace in Bosnia and the Sinai; providing humanitarian assistance in Haiti; pursuing counter drug operations in Central and South America; and working in many other areas to enhance our prospects for peace.

The value of the American soldier in **responding** to a full spectrum of crises at home and abroad is unquestionable. More than 60 percent of the participants in 32 of the 36 major deployments since 1989 have been soldiers. This has been a team effort by all components of the Army, with our Reserve Component having an even greater role. In FY98, the Army National Guard and United States Army Reserve provided more than 5 million man-days in support of either federal or state authorities, including overseas deployments and missions that offset Active Component personnel tempo (PERSTEMPO).

America's Army is **preparing** now for an uncertain future. This includes "asymmetric" threats such as nuclear, biological and chemical weapons, terrorism, and disruption of America's C4I (command, control, communications, computers, and intelligence) networks. It is vitally important that we pursue a focused modernization plan to replace aging systems, enhance existing systems with cutting-edge technologies, and build new systems to ensure continued military superiority.

Our current readiness, shaping the international environment and responding to crises, competes for the same limited resources that are also required to prepare for an uncertain future, our future readiness. Operating with constrained resources, the Army faces significant challenges in balancing future requirements with current capabilities. With these challenges in mind, the Total Army has begun the transformation into a force relevant for the 21st Century security

environment. Success demands careful, continuing analysis and management of near- and long-term risks.

TRANSITION FROM INDUSTRIAL AGE TO INFORMATION AGE ARMY

The Army has embarked on a reasoned, disciplined, deliberate course of change to achieve quantum leaps in capabilities. These changes are a part of the continuous transformation that is needed to remain relevant in an ever-changing geostrategic environment. Change is not new to the Army. The Army has evolved over the last two hundred years, sometimes painfully, sometimes proactively, but changed nonetheless to adapt to the changing world around it. It is the magnitude and nature of the present "change" we are in the midst of, the transition as a society from the industrial age to the informational age, that makes this point in time crucial for us to succeed with our "change" processes. Institutionalizing change is difficult. As stated by former Army Chief of Staff, General Gordon R. Sullivan, "Equally certain is this: the U.S. Army will jeopardize its position as the world's best army if it is satisfied with maintaining the status quo…Thus, despite not knowing the full details, the future is sufficiently clear to move the Army in the right direction."

When societies and states changed from an agrarian base to an industrial base, the way they made war also changed. Industrial nations furnished their armies with tools very different from those produced by agrarian nations: the machine gun, steam and petroleum powered engines, the railroad, telegraph, radios, aircraft, and much more. Furthermore, industrial armies changed in organization. Their leadership requirements were different and they developed new operational concepts. These changes were not easy and usually occurred over many years. The advent of the information age, and the speed at which technological change occurs, mandates the development and use of change processes that maximize the resources of time and money.

The Army has adopted Force XXI as its process for building the information-age Army. The Force XXI process leverages the power of information age technology through a series of experiments ranging from the large-scale Advanced Warfighting Experiments (AWE) to smaller-scale efforts focused on particular functional areas. By streamlining the way we turn concepts into systems, Force XXI provides us with the experimental data needed to maintain the most capable land combat force in the world. It evolved from the requirement to manage revolutionary change extending across virtually all of the functions of joint warfighting. The process allows rapid evaluation of a broad range of technologies, identification of promising areas, and development of new systems in those areas.

Force XXI incorporates a holistic approach to change and ensures that innovations are synchronized. This innovative approach, which we call "spiral development," compresses the development cycle for new systems by fielding prototypes and incorporating new technologies on fielded systems within a designated experimental force. By locating contractors and program managers with the experimental force and conducting various military operations in a training environment, soldiers and leaders are able to provide feedback. Valid feedback is incorporated directly into system improvements, which are then used in further operational tests. This "foxhole to factory" linkage leads to a significantly faster development cycle, and permits a more rapid fielding of new information technology capabilities to soldiers and units.

This process not only develops systems more rapidly than the traditional developmental process; it also provides important insights that are often not evident with more linear development processes until after the systems are fielded. Many of the operational and human factors affecting system characteristics and doctrine do not appear in isolated tests of the system. Only when the system is employed in concert with other Army systems and under demanding conditions do the full implications, strengths, and limitations of the

system emerge. The "spiral development" of the Force XXI process provides insights into doctrinal and force structure adjustments necessary to employ new systems and helps identify leader development and training necessary to prepare soldiers to use new systems effectively.

Today's Army relies heavily on the current industrial base to provide its equipment and support items. It is this industrial base that enabled the Army to attain its status as the world's preeminent land combat force. We recognize the need to help shape the evolving industrial base, with our industry partners, over time as the shift to the information age continues. The Army After Next will be comprised of a mix of newly developed and currently existing legacy systems. Our challenge is to protect the current industrial base while the evolution to a hybrid "industrial age/informational age" industrial base emerges.

THE MODERNIZATION CHALLENGE

Modernization funding for FY00 remains relatively flat, the budget stems the decreases in modernization funding that began 14 years ago. In 1985, we spent almost $28 billion for modernization; by 1998, we were spending nearly $12 billion. Part of that reflects our smaller force. We've downsized the force nearly 40 percent. Our modernization accounts have fallen in excess of 50 percent. In fact, the FY98 budget funded Army procurement at its lowest level, in real terms, since 1960. The FY99 budget broke that trend by adding an extra $1.7 billion for procurement, increasing the modernization total to over $13 billion.

The FY00 budget not only maintains that level of funding but also takes pressure off the modernization account by providing increased funding in the readiness accounts and for base operations and real property maintenance. It is often shortfalls in those accounts that turn modernization into the bill payer for near-term requirements.

In the out years the President's budget request contains the modernization budget increases that will enable us to continue to transform the Army for the future. It will permit us to make substantial investments in digitization, including equipping the First Digitized Division (the 4th Infantry Division) in 2000 and the First Digitized Corps (the III Corps) in 2004. That's our top modernization priority. It will enable us to fill the two critical gaps in our overmatch capabilities -- in artillery and armed reconnaissance -- by continuing development of the Crusader howitzer and the Comanche helicopter. It will enable us to continue modernizing our Reserve Components in accordance with our "first to fight" principle. It will allow us to maintain a credible commitment to our S&T effort, which we are focusing on leap-ahead capabilities that we look to field in our next-generation systems.

Unlike the other services, which procure major systems like multi-billion dollar aircraft carriers, the Army has numerous, smaller scale programs. For years we've been wrestling with how we can effectively articulate our need for our fair share of modernization dollars to fund these lesser scale but no less important programs.

Funding levels in the recent past have forced us to either reduce the quantities of systems or stretch our programs to great lengths or both. These actions raise unit costs and further delay modernization. In many cases, we maintain our procurement programs at minimum sustaining rates rather than more efficient economic rates. For example, we have reduced production quantities and rates for the Multiple Launch Rocket System, the Wolverine bridging system, and the Apache Longbow attack helicopter.

Add to this the fact that our weapon systems are aging because we have not modernized them as quickly as we should have. When coupled with the Army's increased operational tempo over the last decade, increased maintenance is required in order to avoid degradation in operational readiness. More

maintenance means increased operations and support (O&S) costs. The increased O&S costs mean less money for modernization. Dr. Jacques Gansler, DoD's Under Secretary of Defense for Acquisition and Technology, has appropriately called this the "death spiral." It is a trap. With the Abrams tank, for example, we find ourselves struggling to sustain and recapitalize it while, at the same time, we are trying to develop its replacement, the future combat vehicle/future combat system.

Our modernization decisions are designed to equip our soldiers so that in combat they can close with and destroy the enemy. The ground combat battlespace is violent, deadly, and enshrouded in the fog of war. When called, our soldiers will courageously go into that battlespace, and come eye-to-eye with the enemy -- for us. Before we ask them to do that, we ought to make sure we've given them the very best equipment available to accomplish that mission. They need reliable equipment that maximizes their ability to survive. They need state-of-the-art equipment that gives them unprecedented situational awareness across all systems and the mobility and lethality to exploit the advantages that situational awareness brings. They need equipment that provides the maximum means of sustainment as they fight. They need, in short, a robust array of modern equipment that provides them the absolute best warfighting capabilities.

We need to be able to articulate the shortages that we have today across the total force and the additional capability our soldiers will need in the future -- across the total force -- to fight and win our nation's wars. We must be able to express a baseline of systems that we have to recapitalize each year so that our equipment remains effective, safe, and affordable to operate and maintain. I suspect that baseline will be greater than what we are spending today.

We must also work more closely with industry in order to develop and field our systems more rapidly and at lower cost. Persistent budget pressures and the accelerating pace of technological change make our partnership with industry

more essential than ever. We want to do more. We want to explore other partnering arrangements where we spend less money on overhead and more money on soldiers, where we take less time to get better systems into the hands of those whose lives will depend upon them.

ARMY MODERNIZATION PLAN

Our Army Modernization Plan describes the results of the Army's efforts to obtain the capabilities necessary to meet the nation's needs within the limited resources allocated. It explains the Army's modernization process and strategy and:

- presents a concise summary of modernization programs,
- provides an assessment of modernization efforts,
- identifies significant modernization accomplishments with the resources available, and
- identifies modernization shortfalls.

The Army has five modernization goals for the near- and mid-terms.

- **Digitize the Army.** The first Army modernization goal, Digitizing the Army, is the means by which we will achieve information dominance. The results of digitization will revolutionize the conduct and tempo of all phases and types of operations. Digitization involves the use of modern communications capabilities and computers to enable commanders, planners, and shooters to rapidly acquire and share information. This enhanced ability to share information will improve our ability to find and target the enemy rapidly and precisely. Digitization is not a program in the traditional acquisition sense. Rather it is a broad effort to integrate command and control hardware and software, the underlying communication systems, and weapon systems to provide information sharing throughout the battlespace. Our digitization efforts leverage the latest advances in information technology from the

commercial sector. The cornerstone of this effort is equipping the experimental force -- the First Digitized Division (the 4th Infantry Division) in 2000 and the First Digitized Corps (the III Corps) in 2004. The force with the fielded digital capabilities is Army XXI, the intermediate force between today's Army and AAN. It is difficult to overstate the importance of the initial goal of digitization. Because much of this technology is available commercially, appropriate investment is essential to maintain our status as the world's preeminent land combat force in the information age.

- **Maintain combat overmatch.** Although the Army is currently unmatched in ground combat systems, prudent incremental improvements to current systems will be made to ensure that combat overmatch, particularly as it relates to lethality and survivability, is maintained. This requires periodic focused technology insertions to improve combat effectiveness through preplanned product improvement (P^3I) programs. These programs will leverage the technological innovations and maintain much of our industrial base.

- **Sustain essential Research and Development and focus Science and Technology efforts on leap-ahead technology.** The Army S&T program is directly linked to the Army Modernization Strategy and Plan. Maintaining combat overmatch requires continuing the Research and Development (R&D) necessary to insert new technologies into current systems. Deferring the acquisition of most next-generation systems also requires us to focus S&T, R&D, and the industrial base on the identification and development of leap-ahead systems to support the AAN. A focused S&T effort will be required to facilitate this development of leap-ahead systems to bridge the gap created by modernization deferrals. The Army S&T program is a corporate investment in the Army of the future. The approximately $1 billion annual Army S&T investment is balanced between essential near-term enhancements and opportunities for future leap-ahead capabilities. This balance provides critical military technology today, maintains our technical

overmatch in the near- and mid-terms, and ensures our continuing lead as the world's most technologically advanced land power army through the far-term.

- **Recapitalize the force.** Recapitalizing the force means replacing or refitting selected aging systems to ensure operational effectiveness and to control costs. Recapitalization can be achieved through individual system replacement, extended service programs (ESPs), P^3I, depot rebuild, or technology insertion. The objective of this effort is to ensure mission essential systems do not exceed their refit, replace, or retire (R3) points. Recapitalization is necessary to reduce future O&S costs and free up resources for AAN System procurement. Recapitalization is also important for maintaining the industrial capabilities required to introduce leap-ahead technologies as they mature.

- **Ensure Active Component/Reserve Component (AC/RC) interoperability.** We are modernizing the Total Army–One Team, One Fight, and One Future. The Army will continue to modernize the RC consistent with the DoD's "first to fight" principle to ensure that early-deploying AC and RC units are compatible and interoperable. It is therefore imperative to modernize the RC elements in synchronization with their respective force packages, particularly in terms of digitization. The Total Army is committed to fully integrate the RC into Total Army operations. These efforts will help ensure that there is one team to fight one fight and share one future. This means that everybody will have a seat at the table to look at the constrained resources we have, to decide how best to leverage them, to maximize their use, and to make the right decisions for the Total Army. The goal is to use the funding for the Total Army in the most efficient manner, and with the greatest return on our investment.

ARMY MODERNIZATION INVESTMENT STRATEGY

The Army is exploiting the Force XXI process to shape its transformation and develop the required capabilities for the 21st Century. Army XXI, the initial near-term product of the Force XXI process, will have significantly enhanced

capabilities attributable to the leveraging of information technologies, particularly digitization, to gain information dominance over potential enemies. This information dominance, in turn, facilitates enhanced "mental agility" in our soldiers, leaders, and units. Equipping the First Digitized Division (the 4th Infantry Division) in 2000 and the First Digitized Corps (the III Corps) in 2004 is our **top modernization priority**.

Concurrently, the AAN process is examining the nature of warfare to 2025 and beyond. The objective is to develop the strategic, operational, and tactical mobility, or "physical agility," in order to capitalize upon the inheritance of "mental agility" from Army XXI. Combined mental agility and physical agility create full-spectrum dominance. Although we do not know the specific characteristics of the Army After Next, that force will require some operational capabilities that are fundamentally different from today's Army. Our near-term and mid-term modernization actions must position Army XXI to incorporate these required capabilities as it completes its transformation to the Army After Next.

The strategy being implemented to meet these requirements prioritizes investments over time. The investment priorities subtly shift in the near-, mid-, and far-terms to synchronize modernization activities. The Army modernization investment strategy addresses three time periods. The first period runs through 2005 and focuses on **gaining information dominance** and enhanced mental agility via digitized command and control systems. The second period, which runs from approximately 2006 through 2014, will emphasize **institutionalizing and maintaining that dominance**. Throughout both periods, we will maintain overmatch capabilities by selectively buying some overmatch systems and inserting new technologies into existing systems to increase system efficiency or provide enhanced operational performance. Where cost-effective and prudent, we will recapitalize systems able to meet future requirements and extend the useful life of current systems for which we may be able to skip next-generation procurement programs. Concurrently, we will focus Science and Technology (S&T) research efforts on high-payoff, leap-ahead technologies. The third period

runs from approximately 2015 to 2025 and focuses on the payoff from near- and mid-term S&T, i.e., **achieving the "physical agility"** required to capitalize on the mental agility previously attained. Only by selectively skipping the next generation of procurement programs and by being judicious in the upgrading of current systems can we conserve the resources required to conduct the necessary research and development to enable "physical agility" for the AAN.

Messages of the Modernization Plan

Achieving information dominance will complete the Army's transition from an industrial age force to an information age force. Information dominance can create an order of magnitude increase in combat effectiveness. Information dominance is the degree of information superiority that enables information systems and capabilities to achieve an operational advantage in a conflict or to control the situation in military operations other than war, while denying that advantage to the adversary. It is a key objective of the Army's modernization strategy and the priority investment component for the near-term. Information dominance provides the foundation for full-spectrum dominance.

We must continue essential R&D and leap-ahead technology development to maintain the technological edge and to support future Army capabilities. While today's Army is the best in the world, we must maintain the R&D efforts that will provide the necessary technology insertions to maintain our overmatch capabilities. We must also continue to improve systems to reduce the cost of ownership (operations and support). Also important is the need to support science and technology developments that will provide the leap-ahead capabilities required for the Army After Next.

In providing these capabilities, we will focus on **fielding by brigade sets** - the basic warfighting unit that must be totally synchronized and interoperable. Brigade sets, or Brigade Combat Teams (BCT), are the right and logical organization to focus on because it is the lowest echelon where all aspects of the

combined arms are brought together. Systems that comprise the BCTs are interdependent, demanding that a "System of Systems" approach to fielding be used. This approach is the most efficient way to integrate new equipment and organizational capabilities, and also reduces turbulence in the brigade and division. This focus applies to not only fielding of materiel, but also the training of soldiers and units to fully employ it, using a collective training approach similar to the Unit Fielding and Training Plan (UFTP) used in fielding of the Longbow Apache. The UFTP approach will ensure a Brigade Combat Team is reorganized, modernized and trained to task, condition and standard during the fielding window. A "System of Systems" approach to fielding ensures that an organization completes transition in the shortest possible time.

Recapitalize to Modernize. One necessity to achieve long term modernization is recapitalization of existing fleets. Recapitalization is necessary not only to maintain capabilities and manage risk, it is also necessary to reduce operational costs. O&S costs of the Army's equipment have increased due to deferred recapitalization. In order to fund future programs, the Army must invest in recapitalization of its current fleet. By doing so, investment capital (from O&S savings) can be reinvested in future AAN systems. For this, the Army must allocate additional dollars to fund this critical recapitalization need.

Army modernization is a matter of priorities. There are priorities that must be maintained, even at a cost to modernization. Readiness, quality of life, fulfilling strategic roles, and execution of mission requirements are capabilities that must be maintained in the near-term, even though longer-term goals may be put at risk. Current required capabilities include a broad spectrum of peacetime engagement, deterrence, and conflict prevention missions, in addition to fighting and winning major regional contingencies.

Force XXI initiatives that develop doctrine, redesign the force to meet future needs, and provide tough realistic training in new capabilities add to the bill.

These initiatives are necessary, however, to determine efficiencies that can be realized from modernization decisions.

After these requirements are sufficiently funded, the Army modernizes as best as possible while managing risk in the near-term. Many current technology advancements are also available to potential adversaries. This requires that selected existing weapon systems and platforms continue to be updated. As a force multiplier, superior technology contributes to the Army's ability to serve as a credible deterrent and assures minimum casualties during combat by establishing overmatch. Therefore, we must continue to modernize–to maintain the technological edge and to maintain combat overmatch against any potential adversary. Current fiscal constraints do not allow for complete recapitalization of the force's equipment. The Army's modernization strategy is, therefore, tailored to provide the capabilities required to the forces that are most likely to need them.

The Army modernization strategy makes the best use of scarce resources. To make the best use of available resources, the Army uses several enablers that enhance modernization efforts. These enablers include Horizontal Technology Integration (HTI), the Force XXI process and a Joint Warfighter Focus including experimentation and integration.

Horizontal Technology Integration (HTI). The advance of technology outpaces the acquisition cycle. To modernize, the Army must use creative ways to satisfy its needs while streamlining the acquisition process. HTI maximizes technology resources and keeps pace with rapid technology advances. When a technology is identified as providing a significant capability improvement, it may be incorporated into multiple existing platforms that operate together. The **horizontal integration of proven technologies** into existing or new platforms may be accomplished through new acquisitions, product improvements, or system component improvements. This piece of the strategy **greatly reduces the expense of recapitalization** and takes maximum advantage of investment

in previously fielded systems. Through HTI, the Army achieves enhanced interoperability, increased warfighting capability, and savings in both RDA and operating and sustaining funds. These savings can then be reinvested in modernization.

PLANNING FOR "SYSTEMS OF SYSTEMS" INTEGRATION

Using the results of our spiral development process we are hard at work identifying and creating the synergies necessary for Army XXI systems. As we develop the weapon systems that will comprise the Army's dynamic armed reconnaissance partnership, we must ensure integration across all aspects of Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR). The RAH-66 Comanche Helicopter, Future Scout and Cavalry System (FSCS) and Unmanned Aerial Vehicles (UAV) will form the basis for this unique partnership. Integrating these weapon systems using a "systems of systems" methodology will enable us to gain quantum improvements in information gathering and distribution for the warfigther – further enhancing our information dominance goals. To fully reap the benefits of this approach we must establish and develop Common Data Links (CDL) for the UAV. Developing a CDL that enables direct control/communication from air or ground based armed reconnaissance platforms will enable a level of tactical flexibility and synergy unheard of today.

At the same time we are working on fielding Army XXI, we are looking far into the future to design AAN. Our S&T investments are critical to ensuring that the technologies and capabilities to forge the AAN will be available when needed. We are considering plans for a future combat vehicle/future combat system and beginning to consider a family of vehicles for the Strike Force.

In another area, we are farther along. Our first new development for AAN is the Future Scout and Cavalry System (FSCS). It is a cooperative program with the United Kingdom (UK) to design and build a ground system with advanced

technologies in sensors, armor, mobility, and signature management to provide our warfighters with overwhelming ground scout capabilities. FSCS will complement other surveillance and reconnaissance assets such as unmanned aerial vehicles and aerial scouts. In late January, two 42 month contracts were awarded to two United States/UK consortia for the Advanced Technology Demonstration phase. When ATD is complete, one consortia will be selected for Engineering and Manufacturing Development and production.

Preparing America's Army for the 21st Century cannot be adequately addressed in one year or one budget. It requires both long-term vision and near-term commitment. Our ongoing transformation of the force to Army XXI – a force for the early decades of the next century that exploits information-age technologies—to the leap-ahead capabilities we envision for the Army After Next around 2025, is made more difficult by the current pace of contingency operations and our constrained fiscal situation. As the Chief of Staff of the Army has often said, in this period of significant opportunity and dramatic change, providing the resources to fuel and accelerate the transformation while meeting our daily global responsibilities is, perhaps, the greatest institutional challenge facing the Department of the Army.

CONCLUSION

As stated at the outset, the American soldier has shouldered much of the responsibility for shaping the geostrategic environment and responding to a full spectrum of crises at home and abroad. Our need to maintain current readiness competes for the same limited resources we need to modernize the force for the future. The increased usage of Army equipment associated with our prominent role in today's operations causes a higher than programmed toll on the equipment involved. We have delayed recapitalization to sustain our equipment, and we have slowed, stretched, or canceled key programs to maintain current

readiness. Today's modernization is tomorrow's readiness – we must guard these resources as if the lives of our soldiers in 2025 depend on them!

The Army continues to carry the largest burden of risk in its modernization program. The FY00 budget holds modernization accounts at roughly the same level as last year. This funding is sufficient to sustain our highest priority programs at the minimum essential levels to ensure development of future capabilities, but at a pace slower than desired. While we continue to lead the way in implementing Defense Reform Initiatives and other cost-saving measures to generate savings for unfunded modernization priorities, there are significant shortfalls.

As history has shown us time and time again, soldiers on the ground are our nation's strongest signal of resolve and are the ultimate expression of American will. Today's changing world demands that America's Army change with it, and we are. We are using a viable, reasoned, deliberate course of change to transform our industrial age Army into an information age Army for the 21st Century. This is hard work but due to the dedication and initiative of our soldiers we are making progress towards fielding the world's first Information Age Army! Through our Force XXI process, we are moving to create, shape, test, and field a force prepared to meet the challenges of the 21st Century.