

## Excerpts from the 2001 Nuclear Posture Review

*The following significant excerpts from the Nuclear Posture Review were posted on the website of [globalsecurity.org](http://globalsecurity.org), a policy research organization directed by John Pike.*

"Nuclear weapons play a critical role in the defense capabilities of the United States, its allies and friends. They provide credible military options to deter a wide range of threats, including WMD and large-scale conventional military force. These nuclear capabilities possess unique properties that give the United States options to hold at risk classes of targets [that are] important to achieve strategic and political objectives." (p. 7)

However, "U.S. nuclear forces, alone are unsuited to most of the contingencies for which the United States prepares. The United States and allied interests may not require nuclear strikes." A "new mix" of nuclear, non-nuclear, and defensive capabilities "is required for the diverse set of potential adversaries and unexpected threats the United States may confront in the coming decades." (p. 7)

"Greater flexibility is needed with respect to nuclear forces and planning than was the case during the Cold War. The assets most valued by the spectrum of potential adversaries in the new security environment may be diverse and, in some cases, U.S. understanding of what an adversary values may evolve. Consequently, although the number of weapons needed to hold those assets at risk has declined, U.S. nuclear forces still require the capability to hold at risk a wide range of target types. This capability is key to the role of nuclear forces in supporting an effective deterrence strategy relative to a broad spectrum of potential opponents under a variety of contingencies. Nuclear attack options that vary in scale, scope, and purpose will complement other military capabilities. The combination can provide the range of options needed to pose a credible deterrent to adversaries whose values and calculations of risk and of gain and loss may be very different from and more difficult to discern than those of past adversaries." (p. 7)

"Advances in defensive technologies will allow U.S. non-nuclear and nuclear capabilities to be coupled with active and passive defenses to help provide deterrence and protection against attack, preserve U.S. freedom of action, and strengthen the credibility of U.S. alliance, commitments." (p. 7)

"Missile defenses are beginning to emerge as systems that can have an effect on the strategic and operational calculations of potential adversaries. They are now capable of providing, active defenses against short- to medium-range threats." (p. 11)

U.S. military forces themselves, including nuclear forces will now be used to "dissuade adversaries from undertaking military programs or operations that could threaten U.S. interests of those of allies and friends." (p. 9)

"Defensive systems capable of intercepting ballistic missiles, may reduce the need for nuclear weapons to hold at risk an adversary's missile launchers." (p. 9)

"A modern, responsive nuclear weapons sector of the infrastructure is indispensable, especially as the size of the operationally deployed nuclear arsenal is reduced." (p. 10-11)

“The planning process [for the New Triad] not only must produce a variety of flexible, pre-planned non-nuclear and nuclear options, but also incorporate sufficient adaptability to support the timely construction of additional options in a crisis or unexpected conflict.” (p. 11)

## **II. “CONTRIBUTIONS OF THE NEW TRIAD TO DEFENSE POLICY GOALS” (p.12)**

### **(Assure, Dissuade, Deter, Defeat)**

“**ASSURE**” —“U.S. nuclear forces will continue to provide assurance to security partners, particularly in the presence of known or suspected threats of nuclear, biological, or chemical attacks or in the event of surprising military developments. This assurance can serve. to reduce the incentives for friendly countries to acquire nuclear weapons of their own to deter such threats and circumstances. Nuclear capabilities also assure the U.S. public that the United States will not be subject to coercion based on a false perception of U.S. weakness among potential adversaries. (p. 12)

“Defense of the U.S. homeland and protection of forward bases increase the ability of the United States to counteract WMD-backed coercive threats and to use its power projection forces in the defense of allies and friends.” (p. 13)

**"DISSUADE"** — "Systems capable of striking a wide range of targets throughout an adversary's territory may dissuade a potential adversary from pursuing threatening capabilities. For example, a demonstration of the linkage between long-range precision strike weapons and real-time intelligence systems may dissuade a potential adversary from investing heavily in mobile ballistic missiles." (p. 12)

"Defenses can make it more arduous and costly for an adversary to compete militarily with or wage war against the United States. The demonstration of a range of technologies and systems for missile defense can have a dissuasive effect on potential adversaries. The problem of countering missile defenses, especially defensive systems with multiple layers, presents a potential adversary with the prospect of a difficult, time-consuming and expensive undertaking," (p. 13)

"The capacity of the infrastructure to upgrade existing weapon systems, surge production of weapons, or develop and field entirely new systems for the New Triad can discourage other countries from competing militarily with the United States.” (p. 14)

“**DETER**” — “[Missile] [D]efense of U.S. territory and power projection forces, including U.S forces abroad, combined with the certainty of U.S. ability to strike in response, can bring into better balance U.S. stakes and risks in a regional confrontation and thus reinforce the credibility of U. S. guarantees; designed to deter attacks on allies and friends.”

"The [defense R&D and industrial] infrastructure must provide confidence in the reliability of the nuclear stockpile and the ability of command and control structures to withstand attack. More broadly, [it] helps to enhance deterrence of aggression by supporting improved U.S. capabilities to hold at risk high-value targets in the face of an adversary's efforts to conceal, harden, and disperse them." (p. 14)

**"DEFEAT"** — "Composed of both non-nuclear systems and nuclear weapons, the strike element of the New Triad can provide greater flexibility in the design and conduct of military

campaigns to defeat opponents decisively. Non-nuclear strike capabilities may be particularly useful to limit collateral damage and conflict escalation. Nuclear weapons could be employed against targets able to withstand non-nuclear attack, (for example, deep underground bunkers or bio-weapon facilities)." (p. 12-13)

"Missile defenses could defeat small-scale missile attacks intended to coerce the United States into abandoning an embattled ally or friend. Defenses that provided protection for strike capabilities of the New Triad and for other power projection forces would improve the ability of the United States and its allies and friends to counterattack an enemy. They may also provide the President with an option to manage a crisis involving one or more missile and WMD-armed opponents." (p. 12)

### **COMMAND, CONTROL, PLANNING, AND INTELLIGENCE (p. 15)**

"As forces are incrementally changed to meet the New Triad force requirements, command and control (C2) becomes more critical to ensure the effectiveness of the elements of the residual force structure... Strike options will require intricate planning, flexibility, and interface with decision makers throughout the engagement process. Command and control will become more complex and the supporting systems and platforms will require augmentation, modernization, and replacement." (p. 15)

"Accurate and timely targeting information can increase both the lethality of strike capabilities and the possibilities for non-nuclear strike capabilities to substitute for nuclear weapons or provide for the timely positioning of missile defense assets." (p. 15)

### **DEFENSE POLICY GOALS AND RELATED NUCLEAR WEAPONS REQUIREMENTS (p. 15)**

"In a fluid security environment, the precise nuclear force level necessary for the future cannot be predicted with certainty. The goal of reducing, over the next decade, the U.S. operationally deployed strategic nuclear force to the range of between 1,700 and 2,200 warheads provides a degree of flexibility necessary to accommodate changes in the security environment that could affect U.S. nuclear requirements." (p. 15)

### **SIZING THE NUCLEAR FORCE (p. 16)**

"In setting requirements for nuclear strike capabilities, distinctions can be made among the contingencies for which the United States must be prepared. Contingencies can be categorized as immediate, potential or unexpected."

"Immediate contingencies involve well-recognized current dangers... Current examples of immediate contingencies include an Iraqi attack on Israel or its neighbors, a North Korean attack on South Korea, or a military confrontation over the status of Taiwan."

"Potential contingencies are plausible, but not immediate dangers. For example, the emergence of a new, hostile military coalition against the United States, or its allies in which one or more members possesses WMD and the means of delivery is a potential contingency that could have major consequences for U.S. defense planning, including plans for nuclear forces." (p. 16)

Unexpected contingencies are sudden and unpredicted security challenges," like the Cuban Missile Crisis. "Contemporary illustrations might include a sudden regime change by which an existing nuclear arsenal comes into the hands of a new, hostile leadership group, or an opponents surprise unveiling of WMD capabilities." Ibid.

"North Korea, Iraq, Iran, Syria, and Libya are among the countries that could be involved in immediate, potential, or unexpected contingencies. All have longstanding hostility toward the United States and its security partners; North Korea and Iraq in particular have been chronic military concerns. All sponsor or harbor terrorists, and all have active WMD and missile programs." Ibid

"Due to the combination of China's still developing strategic objectives and its ongoing modernization of its nuclear and non nuclear forces, China is a country that could be involved in an immediate or potential contingency." (p. 16-17)

"Russia maintains the most formidable nuclear forces, aside from the United States, and substantial, if less impressive, conventional capabilities. There now are, however, no ideological sources of conflict with Moscow, as there were during the Cold War. The United States seeks a more cooperative relationship with Russia and a move away from the balance of terror policy framework, which by definition is an expression of mutual distrust and hostility. As a result, a; [nuclear strike] contingency involving Russia, while plausible, is not expected." (p. 17)

(U) "Adjusting U.S. immediate nuclear force requirements, in recognition of the changed relationship with Russia is a, critical step away from the Cold War policy of mutual vulnerability and toward more cooperative relations." (p. 17)

(S) "Russia's nuclear forces and programs, nevertheless, remain a concern. Russia faces many strategic problems around its periphery and its future course cannot be charted with certainty. U.S. planning must take this into account. In the event that U.S. relations with Russia significantly worsen in the future, the U.S. may need to revise its nuclear force levels and posture" (p. 17)

## **OPERATIONALLY DEPLOYED AND RESPONSIVE NUCLEAR FORCES**

"The operationally deployed forces are sized to provide the capabilities required to meet the U.S. defense goals in the context of immediate, and unexpected contingencies. That is, a sufficient number of forces must be available on short notice to counter known threats while preserving a small, additional margin in the event of a surprise development. The 1700-2200 warheads the United States is scheduled to deploy in 2012 would constitute the operationally deployed force." (p. 17)

"The responsive force is intended to provide a capability to augment the operationally deployed force to meet potential contingencies. The responsive force ... retains the option for leadership to increase the number of operationally delayed forces in proportion to a severity of an evolving crisis. A responsive force need not be available in a matter of days, but in weeks, month, or even years. For example, additional bombs could be brought out of the non-deployed stockpile in days or weeks. By contrast, adding additional weapons to the ICBM force could take as long as a year for a squadron in a wing. The responsive force [also] provides a reserve from which replacements can be provided for operationally deployed weapons, that evidence reliability problems."

## **US NUCLEAR FORCE SIZE**

"Based on current projections, an operationally deployed force of 1700-2200 strategic nuclear warheads by 2012 ...will support US deterrence policy to hold at risk what opponents value, including their instruments of political control and military power, and to deny opponents their war aims. The types of targets to be held at risk for deterrence purposes include leadership and military capabilities, particularly WMD, military command facilities and other centers of control and infrastructure that support military forces."

"The planned force, structure for 2012 comprises 14 Trident SSBNs (with two of the 14 in overhaul at stay time) 500 Minuteman II ICBMs, 76 B-52H bombers, and 21 B-2 bombers."

## **THE PATH FOR NUCLEAR REDUCTIONS**

"A conceptual path toward an operationally deployed force of 1,700-2,200 warheads in 2012 ... eliminates Peacekeeper ICBMs, removes 4 Trident SSBNs from strategic service, and downloads weapons from Trident SLBMs, Minuteman III ICBMs; and B-52H and B-2 bombers. This will result in 3,300 operationally deployed strategic nuclear warheads by 2007 (SLBM warheads for SSBNs in overhaul will not be counted as operationally deployed because those submarines are unavailable for alert patrols)." (p. 19)

"Subsequent reductions below the 3,800 operationally deployed warheads can be achieved through a variety of methods. The precise method will be determined in the course of periodic reviews the Department will conduct beginning in 2003. The Secretary of Defense will direct that these reviews be undertaken with the participation of the Chairman of the Joint Chief's of Staff, the Commander in Chief of U.S. Strategic Forces Command, and the NNSA Administrator." (p. 19)

## **III. CREATING THE NEW TRIAD**

"To meet the demands of the New Triad, and overhaul of existing capabilities is needed, This includes improving the tools used to build and execute strike plans so that the national leadership can adapt pre planned options, or construct new options, during highly dynamic crisis situations." (p. 23)

"In addition, the technology base and production readiness infrastructure of both DoD and NNSA must be modernized so that the United States will be able to adjust to rapidly changing situations ....adjustments may be needed to match capabilities of the remaining nuclear forces to new missions... a need may arise to modify, upgrade, or replace portions of the extant nuclear force or develop concepts for follow on nuclear weapons better suited is the nation's needs. It is unlikely that a reduced version of the Cold War nuclear arsenal will be precisely the nuclear force that the United States will require in 2012 and beyond." (p. 23)

"The FY04 DPG [Defense Planning Guidance] will provide guidance to coordinate and de-conflict requirements for nuclear and non nuclear systems." (p. 24)

"Initiatives reflected in the proposed FY03-07 Future Years Defense Plan (FYDP) include:

- *Mobile and Relocatable Targets.* DoD proposed to develop a systems-level approach, applied across the Services, for holding at risk critical mobile targets.

- *Defeating Hard and Deeply-Buried Targets.* DoD would implement a program to improve significantly the means to locate, identify, characterize, and target adversarial hard and deeply buried targets.
- *Long Range Strike.* DoD will pursue a systems level approach to defeat critical fixed and mobile targets at varying ranges, in all terrain and weather conditions, and in denied areas.
- *Guided Missile Submarines (SSGNs).* DoD has proposed to fund the conversion of four SSBNs, withdrawn from the strategic nuclear service, to SSGN configuration.
- *Precision Strike.* Effort to increase the number of targets than can be attacked on a single mission. Elements include a “Malfunction Information Distribution System” to provide “a jam-resistant, secure, digital network for exchange of critical information for strike capabilities,” a “Joint Air-to-Surface Standoff Missile.” A “Small Diameter Bomb,” and the “Unmanned Combat Air Vehicle.”
- *New Strike System,* "DoD will begin in FY03 to explore concepts for a new strike system that might arm the converted SSGNs. Desired capabilities for this new strike weapons include timely arrival on target, precision, and the ability to be retargeted rapidly." (p. 24-25)

## **Ballistic Missile Defense**

"The President has stated that the mission for missile defense is to protect all 50 states, our deployed forces, and our friends and allies against ballistic missile attacks. The Department has reorganized its ballistic missile defense program. The program is pursuing missile defense based on the following guidance:

- Missile defense is most effective if it is layered, that is, able to intercept ballistic missiles of any range in all phase of their flight.
- The United States seeks effective defenses against attacks by small numbers of longer-range missiles as well as defenses against attacks by larger numbers of short- and medium-range missiles.
- Missile defense systems, like all military systems, can be less than 100-percent effective and still make a significant contribution to security by enhancing deterrence and saving lives if deterrence fails." (p. 25)

"Other than the PAC-3, the United States has not yet chosen systems for deployment; that decision will depend on the evolution of both technology and the threat. The Department is exploring a wide range of alternative approaches. There are two dimensions to the missile defense program: near-term emergency capabilities; and improved variants of these capabilities leading to more robust, operational systems. Several near term and mid term options (2003-2008) that could provide an emergency missile defense capability are under consideration, including:

- A single Airborne Laser for test phase intercepts may be available for limited operations against ballistic missiles of all ranges;
- A rudimentary ground based midcourse system, consisting of a small number of interceptors taken from the test program and an upgraded Cobra Dane radar in Alaska, could be available against longer range threats to the United States; and
- A sea based Aegis system could be available to provide rudimentary midcourse capability against short to medium range threats," (p. 26)

“Based on the technical progress of these systems, the United States could deploy operational capabilities beginning in the 2006-2008 period including:

- 2-3 Airborne Laser aircraft
- Additional ground based midcourse sites
- 4 sea-based midcourse ships
- terminal systems, able to defend against shorter range threats. PAC 3, which began deployment in 2001, and THAAD, which could be available by 2008.” (p. 26)

"DOD will develop the low orbit constellation of SBIRS Low satellites to support missile defense. This system will provide capabilities to track enemy ballistic missiles and to assist in the discrimination of reentry vehicles and other objects in flight." (p. 29)

### Command and Control Intelligence

[the Secretary of Defense] "established a Federal Advisory Committee (FAC) to conduct an independent, end to end review of all activities involved in maintaining the highest standards of nuclear weapons safety, security, control, and reliability" This "End to End Review" was conducted concurrently with the NPR but was completed before the NPR deadline. While the review is not yet final, the FAC presented an "urgent preliminary finding to the Secretary subsequent to the events of September 11 identifying the need to expand the current nuclear command and control (C2) architecture to a true national command and control conferencing system." (p. 26)

"The attacks of September 11 dramatically highlighted the requirement for secure, wideband communications between fixed and mobile command centers and national decision makers. The Department is developing a secure wideband communications architecture and procedures ... The Department will initiate a satellite communications system in FY03, the Advanced Wideband System (AWS), that incorporates interoperable laser communications and will be designed to meet the needs of the defense and intelligence community for wideband tactical, protected tactical (replaces Advanced EHF satellites) broadcast, and relay communications with a planned system first launch during FY09. The Department supports the effort to implement a secure, wideband capability on all strategic C2 platforms. Wideband complements, but does not replace, the requirement for assured, survivable, and enduring nuclear C2." (p. 27)

The "2001 Emergency Supplemental Appropriations Act for Recovery from and Response to Terrorist Attacks on the United States" provided immediate upgrades to aircraft for national leadership, and the Department has programmed funding for additional wideband upgrades including the E-4 National Airborne Operations Center aircraft.

"Three Advanced Extremely High Frequency (AEHF) spacecraft are planned for an initial operating capability of FY08 that will provide nuclear survivable (e.g. against high altitude electromagnetic pulse), anti jam, low and medium data rate communications to strategic and tactical users"

"The Department will initiate in FY03 an Extremely High Frequency (EHF) communications satellites program primarily for national and strategic users requiring nuclear protected communications in the mid latitude and polar regions with a planned first launch during FY09. Survivable, jam resistant, secure voice conferencing among principal nuclear C2 decision

makers remains essential to facilitate discussions of tactical warning and assessment, response option, and force management." (p. 27)

". . . substantial investment in nuclear C2 cryptographic systems ... new nuclear C2 capabilities must be leveraged with new technologies (p. 27)

### Intelligence

"Significant capability shortfalls currently exist in: finding and tracking mobile and relocatable targets and WMD sites: locating, identifying, and characterizing hard and deeply buried targets (HDBTs); [and] providing intelligence support to Information Operations and federated intelligence operations " (p. 28)

"To provide continuous and persistent intelligence, surveillance, and reconnaissance of critical regions,, the Department proposes to develop in its FY03-07 FYDP a "system of systems that consists of space, airborne, surface, and subsurface capabilities. Sensors for this system will include a mix of phenomenology, allow for agile and flexible response, and operate across the electro-magnetic spectrum" (p. 28)

"New concepts far: persistent surveillance from air and space based platforms including hyper-spectral imaging, are proposed in the FY03 budget. (ibid).

"Intelligence for Information Operations (IO). Information Operations targeting, weaponizing, and execution requires intelligence collection of finer granularity and depth than is currently available. The intelligence community lacks adequate data on most adversary computer local area networks and other command and control systems. Additionally, there is limited analytical capability to exploit these networks using IO tools. Investments must continue in order to upgrade and, populate the Modernized Integrated Database to enable effective IO targeting, weaponizing, and combat assessment essential to the New Triad."

### **Adaptive Planning (p. 29)**

"The current nuclear planning system, including target identification, weapons system assignment, and the nuclear command and control system requirements, is optimized to support large, deliberately planned nuclear strikes. In the future, as the nation moves beyond the concept of a large, Single Integrated Operational Plan (SIOP) and moves toward more flexibility, adaptive planning will play a much larger role."

"Deliberate planning creates executable war plans, prepared in advance, for anticipated contingencies. Adaptive planning is used to generate war plans quickly in time critical situations. Deliberate planning provides the foundation for adaptive planning by identifying individual weapon/target combinations that could be executed in crises."

"For contingencies for which no adaptive planning has been done, fully adaptive planning will be required, The desire to shorten the time between identifying a target and having an option available will place significant stress on the nuclear planning process as it currently exists. Presently 12-48 hours is required to develop a plan to attack a single new target, depending on the weapon system to be employed. A more flexible planning system is needed to address the requirements of adaptive planning."

"To make the Strategic Warfare Planning System (SWPS) more responsive to adaptive planning scenarios, a comprehensive SWPS Transformation Study has been initiated and is being conducted by U.S. Strategic Command. Results will be available in late spring 2002. To meet the requirements of adaptive planning, an upgrade of the existing nuclear C2 architecture is needed.

## **DOD Infrastructure Issues**

"DOD has identified shortfalls in current infrastructure sustainment programs for nuclear platforms. These include the following: solid rocket motor design, development and testing technology for current and future strategic systems; improved surveillance and assessment capabilities; command and control platforms and systems; and design, development, and production of radiation hardened parts." (p. 30)

"In support of this effort, the **Defense Science Board Task Force on System Technology for the Future U.S. Strategic Posture** is considering strategies for enhancing the ability of the U.S. technology base to deal with or hedge against uncertainties in the nature and timing of potential strategic threats, the capability of the technology and industrial base to respond in a timely manner, and the adequacy and responsiveness of science and technology programs related to possible future strategic capabilities. In addition, the **U.S. Strategic Command Advisory Group on Strategic Platforms** is addressing weapon system viability and nuclear force readiness." (p. 30)

## **The Current U.S. Nuclear Warhead Infrastructure**

"Underinvestment in the infrastructure - in particular the production complex - has increased the risks that if substantial problems in the stockpile are discovered, future options to refurbish or replace existing designs will be limited. For example, although an interim pit production capability will be established later in this decade, no current capability exists to build and certify plutonium pits, certain secondary components, or complete warheads." (p. 30)

"The need is clear for a revitalized nuclear weapons complex that will: ...be able, if directed, to design, develop, manufacture, and certify now, warheads in response to new national requirements; and maintain readiness to resume underground nuclear testing if required." (p. 30)

## **Stockpile Maintenance**

"DOD and NNSA are in the preliminary stages of determining the requirements for nuclear warheads for the New Triad. As the New Triad is developed and fielded, DoD and NNSA will have to reassess how the warheads in the stockpile are characterized. At present, the warhead stockpile is divided into two categories: active and inactive:

- Active stock pile warheads are maintained in a ready for use configuration with tritium and other limited life components installed. They incorporate the latest warhead modifications. The active stockpile includes all deployed warheads, warheads for the responsive force, and logistics spares for each warhead type.
- Inactive stockpile warheads do not have limited life components installed, and may not have the latest warhead modifications. These warheads serve a number of purposes ranging from reliability replacements that act as a hedge against the discovery of a problem with a large number of active warheads, to the more predictable replacement of warheads consumed by quality assurance and reliability testing. This hedge is re-

quired because the United States will not have, for a decade or more, the capacity to produce certain new components for warheads. The time it would take to deploy warheads in the inactive stockpile depends on the delivery system, and availability of tritium gas and other limited-life components. These warheads or their components could also be used to provide new capabilities. This time would range from weeks in the case of bombers, to years in the case of ICBMs." (p. 31-32)

"There are almost 8,000 warheads in the active stockpile today. As the initial nuclear warhead reductions are implemented, some warheads will be transferred from the active to the inactive stockpile. For example, the removal from strategic service of the 4 SSBNs will result in the transfer of over 700 W76 warheads to the inactive stockpile. By 2012 approximately 3,000 warheads, now in the active stockpile, are planned to be transferred to the inactive stockpile or retired." (p. 32)

"Some of the W87 Peacekeeper warheads will be redeployed on Minuteman ICBMs under the Safety Enhanced Reentry Vehicle (SERV) program Each W87 warhead will displace one W62, or three W78 warheads currently deployed on Minuteman. To provide warhead diversity in the force, some SERV modified Minuteman missiles would carry the W79 warhead. A number of W78 and W87 warheads will be retained as reliability replacements and surveillance assets to support the responsive force. In addition, the W62 will be retired by the end of Fiscal Year 2009. (p. 32)

"The active stockpiles also includes the nonstrategic nuclear weapons."

"The United States will retain an inactive stockpile of nuclear weapons. The size of that stockpile is yet to be determined. It will be driven by the capacity of the nuclear weapon complex to refurbish and dismantle weapons. For example, today the complex can process - either refurbish or dismantle - roughly 350 weapons per year. If the NNSA's proposed plan is funded, that number should increase to roughly 600 per year." (p. 32)

"A major challenge for nuclear weapons programs over the next two decades will be to refurbish, and thereby extend the life of, at least seven types of nuclear warheads" [a table lists these as B61 -3, 4, 10; B61-7, 11; W76; W78; W80-0, 1; B83-0; B83-1; W87; and W88.]

## **Restoring Production Infrastructure**

*"Warhead Assembly and Disassembly:*...Plans are underway to expand the capacity and capability of the Pantex Plant to meet the planned "workload for dismantlement and remanufacturing of existing weapons." (p. 33)

*"Uranium Operations:* At least seven to eight years of effort will be required to restore the capability to produce a complete nuclear weapon secondary at the Y-12 Plant in Tennessee. Qualified processes for some material and manufacturing steps are not currently in place. Plans are underway to expand the capacity and capability of the Y-12 Plant to meet the planned workload for replacing warhead secondaries, and other uranium components." (p. 33)

*"Plutonium Operations:* One glaring shortfall is the inability to fabricate and certify weapon primaries, or so-called "pits". Work is underway to establish an interim capability at Los Alamos National Laboratory late in this decade to meet current demand created by destructive surveillance testing on the W88 warhead. For the long term a new modern production facility

will be needed to deal with the large scale replacement of components and new production." (p. 33)

*"Other Component and Material Production:...* Tritium production, halted since 1988, is programmed to resume in FY03 with first deliveries to the stockpile scheduled for FY06. Additionally, warhead refurbishment plans require modern facilities at Y-12's Special Materials Complex for manufacturing unique materials." (p. 14)

## **NNSA Initiatives for Nuclear Weapons Programs**

"As a result of the NPR, NNSA will undertake several initiatives...

**Advanced Concepts Initiative:**...There are several nuclear weapon options that might provide important advantages for enhancing the nation's deterrence posture: possible modifications to existing weapons to provide additional yield flexibility in the stockpile; improved earth penetrating weapons (EPWs) to counter the increased use by potential adversaries of hardened and deeply buried facilities; and warheads that reduce collateral damage. (p. 34-35)

"To further assess these and other nuclear weapons options in connection with meeting new or emerging military requirements, the NNSA will reestablish advanced warhead concepts teams at each of the national laboratories and at headquarters in Washington. This will provide unique opportunities to train our next generation of weapon designers and engineers. DoD and NNSA will also jointly review potential programs to provide nuclear capabilities, and identify opportunities for further study, including assessments of whether nuclear testing would be required to field such warheads." (p. 35)

"The [Feb. 2001 Foster] Panel recommendation that DOE/NNSA assess the feasibility and cost of reducing the time [to resume testing] to 'well below the Congressionally-mandated one year' (sense of the Congress as expressed in the 1996 Resolution of Ratification for the START II Treaty) was addressed as part of the NPR." (p. 35)

"Test Readiness is maintained principally by the participation of nuclear test program personnel in an active program of stockpile stewardship experiments carried out underground at the Nevada Test Site (NTS). There are two concerns about the current test readiness program."

"First, ... the current 2-3 year test readiness posture will not be sustainable as more and more experienced test personnel retire. Not all of the techniques and processes required to carry out underground nuclear tests - including nuclear diagnostic instrumentation, containment, design and emplacement of diagnostic equipment in a vertical shaft, drillback and radiochemical analysis are exercised with the subcritical experimentation work carried out at the NTS. As experienced personnel retire, it will become more difficult to train new people in these techniques, further degrading test readiness. This argues for an approach in which all key capabilities required to conduct underground nuclear tests are identified and exercised on projects making use of a variety of nuclear testing related skills." (p. 35-36)

"Second, the 2-3 year posture may be too long to address any serious defect that might be discovered in the future."

"Given the certainty of surprise in the future and the broad spectrum of threats, the United States also must have the capability to understand the technological implications of nuclear weapon concepts and countermeasures tested by other states, to ensure that U.S. weapons and

delivery platforms (including advanced conventional strike systems) perform effectively. If necessary, this will enable the United States to initiate research into whether it needs to develop an entirely new capability one that is not a modification of an existing weapon in time to address the threat." (p. 36)

"To address these concerns... NNSA proposes over the next three years to enhance test readiness by: augmenting key personnel and increasing their operational proficiency; beginning the mentoring of the next generation of testing personnel; conducting additional field experiments including additional subcritical experiments and test related exercises of appropriate fidelity; replacing key underground test unique components (e.g. Field Test Neutron Generators); modernizing certain test diagnostic capabilities; and decreasing the time required to show regulatory and safety compliance. DoD and NNSA will work to refine test scenarios and evaluate cost/benefit tradeoffs in order to determine, implement, and sustain the optimum test readiness time that best supports the New Triad." (p. 36)

Meeting Warhead Production Commitments to DoD . ...A key capability that must be recovered is manufacture of plutonium pits. In addition to our efforts to establish a limited production capability at Los Alamos, NNSA will accelerate preliminary design work on a modern pit manufacturing facility so that new production capacity can be brought on line when it is needed." (p. 36)

### **People with Critical Skills**

The DoD and NNSA will jointly support opportunities that provide end-to-end demonstration of integrated capabilities involved with warhead design, development, manufacturing, and warhead/weapon integration. A key objective is to exercise critical skills for adapting warheads to DoD weapon delivery systems; ...NNSA will include the following as goals for the new Advanced Concepts Initiative:

- Transfer of warhead design knowledge from the current generation of designers to the next generation
- Exercise of DoD/NNSA program integration skills.

### **Nuclear Force Sustainment and Modernization**

"No plans to phase out [dual capable] F-15E; Phase out F-16 once dual capable JSF is deployed."

[Concerning ICBMs] "The focus of the Department's efforts are to extend the life of the MM III weapons system until 2020 while beginning the requirements process for the next generation ICBM"

A comprehensive set of sustainment programs are planned or underway:

- Guidance Replacement Program (GRP) Propulsion Replacement Program (PRP)
- Propulsion System Rocket Engine (PSRE) life extension program ("replaces aging components in the past boost vehicle")
- Rapid Execution and Combat Targeting (REACT) service life extension program
- Environmental Control System (ECS)
- Safety Enhanced Reentry Vehicle (SERV) program.

"The SERV program reconfigures the MM III ICBM to carry the Mk21 reentry vehicle which is currently deployed on Peacekeeper missiles." (p. 41)

"Peacekeeper deactivation will occur over a 36 Month period [beginning in FY03] with missiles remaining on alert and fully mission capable throughout the deactivation period. ...The Department analyzed the role of the Peacekeeper against projected threats in the post Cold War environment and judged that its retirement would not have an adverse effect on the sufficiency of US nuclear forces. DoD plans to retain the booster stages for potential future uses such as space launch or target vehicles." (p. 41)

**"Follow on ICBM:** The Air Force Systems Command (AFSPC) led the Ballistic Missile Requirements (BMR) Study (1998 to 2000) which documented a number of needs beyond the current baseline ICBM mission, such as extended range, trajectory shaping, strategic relocatable targets, and hardened deeply buried targets, that the next generation ICBM could address. The Land Based Strategic Nuclear Deterrence Mission Needs Statement (MNS) drew from the analysis done in the BMR study in documenting the need for ICBMs beyond 2020. To expand on the MNS and address alternatives for the follow on ICBM, AFSPC plans to conduct an analysis of alternatives in FY04 and FY05 with an IOC by 2018. This work will ensure the requirements generation process and the acquisition process remain on track for the future ICBM force." (p. 41)

**"Trident SSBN:** ...The Administration intends to convert four SSBNs from the current force of 18 submarines to carry special operations forces as well as conventional cruise missiles. Achieving this force structure also requires converting four of the eight Trident I (C 4) SSBNs to carry the Trident D 5 missile. The Navy has extended the Trident hull life to 44 years. This in turn will require the DoD to extend the service life of the D 5 SWS [Strategic Weapons System] as well. The first of the 14 Trident SSBNs remaining in service will be retired in 2029."

**"Trident II SLBM:** ... DoD will fund the D-5 Life Extension Program, which continues production of D-5 missiles, and upgrades the guidance and missile electronics systems on existing missiles. The continued production of additional D 5 missiles is needed in order to prevent a shortage of missiles in the next decade." (p. 42)

**"Follow on SSBN:** ... DoD assumes the continued requirement for a sea based strategic nuclear force. Therefore, the timeframe when the next generation SSBN will need to be deployed is about 2029 when the first of the remaining operational Trident SSBNs is planned to be retired. The Navy is currently studying two options for future follow on SSBNs: (1) a variant of Virginia class nuclear attack submarines (SSN); and (2) a dedicated SSBN (either a new design or a derivative of the Trident SSBN) ... If the decision is made to develop a new dedicated SSBN, a program would have to be initiated around 2016 to ensure that a new platform is available in 2029." (p. 42)

**"Follow on SLBM.** A new SLBM would be needed in about 2029 to match the schedule for a follow on SSBN. The Navy has begun studies to examine range payload requirements and missile size, but no specific plans for a follow on SLBM at this point other than extending the service life of the Trident D 5." (p. 42)

**"Common Missile.** The Department of Defense does not plan to pursue a common ICBM/SLBM ballistic missile at this time. However, the Air Force and Navy are currently cooperating in research and development on common technologies related to current and fu-

ture ballistic missiles the Guidance Applications Program (GAP), Reentry Systems Applications Program (RSAP), Propulsion Applications Program (PAP), and Technology for the Sustainment of Strategic systems (TSSS) Programs." (p. 42-43)

### **Heavy Bombers/Air Launched Cruise Missiles (p. 43)**

**Strategic Bombers.** The Air Force plans to keep the current B-2 and B-52 fleet operational for another 35-40 years. An aggressive sustainment and modernization effort for both platforms is required to support this plan. In particular, upgrades to Communications, avionics, processors, radar systems, displays, and navigation equipment are essential to keep the fleet affordable and operationally relevant throughout this period.

"Assured, worldwide, survivable two way connectivity between the National Command Authorities and the strategic bomber force is a fundamental element of strategic command and control. B-52s and B-2s must transition to Advanced Extremely High Frequency (AEHF) satellite communications in order to ensure continued Connectivity with National Command elements."

"Situational Awareness (SA) and electronic countermeasures (ECM) remain the highest priority B-52 upgrades. The inability to adapt to and counter threats, the high failure rate of SA and ECM equipment components, parts obsolescence, and a vanishing vendor base severely limit the B-52's ability to operate in a combat environment. To that end, the Electronic Countermeasure Improvement, Situational Awareness Defense Improvement, and Low-Mid Band Jammer replacement programs are essential to ensuring the B-52 remains a viable combat asset beyond 2006."

The B-52 also requires a highly reliable and accurate navigation system to conduct worldwide tasking and nuclear weapons deliveries. The Inertial Navigation system (INS) represents the heart of the B-52 navigation suite but is reaching the end of service life and is increasingly cost prohibitive to support. The Avionics Mid-Life Improvement program addresses this issue by replacing the INS and other obsolete B-52 avionics components required for precision navigation and weapons delivery."

Several upgrades are currently underway on the B-2. These upgrades include AHFM (Alternate High Frequency Material) which improves the ability to maintain the low observable materials of the aircraft: UHF/SATCOM upgrade; JASSM upgrade; Mk-82 Smart Bomb Rack Assembly upgrade; and Link-16 upgrade.

**"Air Launched Weapons Systems.** The Air Force recently determined that its current force of cruise missiles can be sustained until 2030." (p. 43)

**"Follow on Strategic Bombers "** Based on current estimates, "a new bomber will need to be operational by approximately 2040. A need for additional or improved bomber capabilities could, however, move the 'need date' closer to the present... The Air Force recently funded a science and technology effort for the Long Range Strike Aerospace Platform X to further explore options." (p. 43-44)

**"Follow on Air Launched Weapon Systems.** There are no plans at this time for a follow on nuclear ALCM... However, conventional cruise missile programs (such as the Extended Range Cruise Missile) are planned that could support an accelerated timetable if necessary, but would have to be modified to carry nuclear warheads."

**Dual Capable Aircraft**, DoD is considering options and their associated costs to either extend the life of the dual capable F-16C/Ds and F-15Es or make a block upgrade to the Joint Strike Fighter (JSF) aircraft... The Operational Requirements Document for the JSF requires that initial design permit nuclear capability to be incorporated at a later date (after IOC, currently scheduled for 2012) at an affordable price.

"Dual capable aircraft and nuclear weapons in support of NATO. DoD will not seek any change to the current posture in FY02 but will review both issues to assess whether any modifications to the current posture are appropriate to adapt to the changing threat environment. A plan is already underway to conduct a NATO review of U.S. and allied dual capable aircraft in Europe and to present recommendations to Ministers in summer of 2002. Dual capable aircraft and deployed weapons are important to the continued viability of NATO's nuclear deterrent strategy and any changes need to be discussed within the alliance." (p. 44)

**Tankers** The current fleet of KC-135s will be operational for the next 35-40 years. The aging fleet, will begin a long phased retirement starting in 2013 and continuing until approximately 2040, The Air Force anticipates constant upgrades to avionics, displays, and navigation equipment over the coming years. However, the current KC-135 fleet is not equipped with a survivable communications capability, limiting its effectiveness in a stressed environment. The Air Force is evaluating a follow on tanker in conjunction with a follow on common airframe airlift and special missions platform. The service is also considering the lease or purchase of 100 off the shelf 767 tankers as an interim measure prior to the need to produce the KC-X replacement platform. In developing alternatives, consideration needs to be given to the possibility that aircraft will operate in a nuclear, biological and chemical weapons environment." (p. 44-45)

**Robust Flight Testing, Aging, and Surveillance.** Air Force and Navy nuclear systems require robust flight testing programs to provide operationally representative data on weapon system performance and to predict weapon system reliability and accuracy... Currently, only the D 5 missile system fulfils the required annual flight tests." (p. 45)

"**Nuclear Warhead Sustainment...** The active stockpile quantities will be sufficient to arm the operationally deployed and responsive nuclear force, and provide sufficient logistics spares. The inactive stockpile will consist of warhead types in the active stockpile plus the W84 and B83 Mod 0, which have no active stockpile counterparts. The W62 warhead will be retired in FY09." (p. 45)

"The NNSA has initiated a program to energize design work on advanced concepts at the three design laboratories, This initiative will be focused on evolving DoD requirements." (p. 46)

### **Limitations in the Present Nuclear Force**

"Today's nuclear arsenal continues to reflect its Cold War origin, characterized by moderate delivery accuracy, limited earth penetrator capability, high yield warheads, silo and sea based ballistic missiles with multiple independent reentry vehicles, and limited retargeting capability."

"New capabilities must be developed to defeat emerging threats such as hard and deeply buried targets (HDBT), to find and attack mobile and relocatable targets, to defeat chemical or biological agents, and to improve accuracy and limit collateral damage. Development of these

capabilities, to include extensive research and timely fielding of new systems to address these challenges, are imperative to make the New Triad a reality."

## **Defeating Hard and Deeply Buried Targets**

"More than 70 countries now use underground Facilities (UGFs) for military uses. In June 1998, the Defense Science Board Task force on Underground Facilities that there are over 10,000 UGFs worldwide. Approximately 1,100 UGFs were known or suspected strategic (WMD, ballistic missile basing, leadership or top echelon command and control) sites. Updated estimates from DIA reveal this number has now grown to over 1,400. A majority of the strategic facilities are deep underground facilities. These facilities are generally the most difficult to defeat because of the depth of the facility and the uncertainty of the exact location. At present the United States lacks adequate means to deal with these strategic facilities. A detailed report on this issue was provided to the Congress recently (Report to Congress on the Defeat of Hard and Deeply Buried Targets, July 2001). (p. 46)

"To deny the enemy sanctuary in HDBTs requires timely identification and characterization of potential targets, realistic defeat alternatives, and accurate assessment of damage done by the attack. Achieving the desired level of capability requires the integration of Service and National systems into a robust, highly responsive system of systems capable of addressing the threat. Improved command and control and intelligence in support of the New Triad will be a key enabler to address this capability shortfall." (p. 47)

"In general, current conventional weapons can only 'deny' or 'disrupt' the functioning of HDBTs and require highly accurate intelligence and precise weapon delivery a degree of accuracy and precision frequently missing under actual combat conditions. Similarly, current conventional weapons are not effective for the long term physical destruction of deep, underground facilities. (p. 47)

"The United States currently has a very limited ground penetration capability with its only earth penetrating nuclear weapon, the B61 Mod 11 gravity bomb. This single-yield, non-precision weapon cannot survive penetration into many types of terrain in which hardened underground facilities are located. Given these limitations, the targeting of a number of hardened, underground facilities is limited to an attack against surface features, which does not does not provide a high probability of defeat of these important targets." (p. 47)

"With a more effective earth penetrator, many buried targets could be attacked using a weapon with a much lower yield than would be required with a surface burst weapon. This lower yield would achieve the same damage while producing less fallout (by a factor of ten to twenty) than would the much larger yield surface burst. For defeat of very deep or larger underground facilities, penetrating weapons with large yields would be needed to collapse the facility." (p. 47)

"To defeat HDBT it is necessary to improve significantly U.S. means to locate, identify, characterize, and target HDBTs. This objective also requires deliberate pre-planned and practiced missions and the development and procurement of several types of conventional earth penetrating munitions. A number of Special Operations Forces and information capabilities will need to be developed to support this goal. Investment and organization will yield a new level of capability for the stated objectives by 2007, with new technologies deployed by 2012. One effort to improve the U.S. capability against HDBTs is a joint DoD/DOE phase 6.2/6.2A Study to be started in April 2002. This effort will identify whether an existing warhead in a

5,000 pound class penetrator would provide significantly enhanced earth penetration capabilities compared to the B61 Mod 11." (p. 47)

### **Mobile and Relocatable Targets**

"One of the greatest challenges today is accounting for the location uncertainty of mobile and relocatable targets... To respond to this challenge, collection systems and techniques that defeat adversary relocation capabilities must be developed. Sensors must also be capable of defeating camouflage and concealment efforts and detecting and exploiting new command and control systems."

"To locate successfully and maintain track on mobile targets until a weapon can be planned and executed, several enhancements need to be made to the current collection capability. Today's satellite constellation is not optimized for the current and developing mobile target challenge. Planned improvements to this constellation would provide the capability to rapidly and accurately locate and track mobile targets from the time they deploy from garrison until they return. Sensors with rapid revisit or dwell capability over deployment areas combined with automated exploitation sides are required to provide this capability." (p. 47-48)

### **Defeat of Chemical and Biological Agents**

DoD and DOE efforts are underway to counter the asymmetric use of chemical and biological weapons (referred to as agent defeat). Agent Defeat Weapon (ADW) concepts are being evaluated to deny access to, immobilize, neutralize, or destroy chemical or biological weapons. Overcoming uncertainties in intelligence regarding agent production and storage locations as well as physical geometries of known facilities and contents appear to be the largest challenges. A variety of ADW concepts are currently under study, including thermal, chemical, or radiological neutralization of chemical/biological materials in production or storage facilities, as well as several types of kinetic penetrators to immobilize or deny use of those materials." (p. 48)

### **Improved Accuracy for Effectiveness and Reduced Collateral Damage**

"Desired capabilities for nuclear weapons systems in flexible, adaptable strike plans include options for variable and reduced yields, high accuracy, and timely employment. These capabilities would help deter enemy use of WMD or limit collateral damage, should the United States have to defeat enemy WMD capabilities." (p. 48)

### **Nuclear Force Modernization**

"The Chairman of the Joint Chiefs of Staff has initiated a *Strategic Deterrent Joint Warfighting Capability Assessment* to characterize the requirements for nuclear weapon systems in the 2020 timeframe. The assessment is to be complete in early FY03." (p. 48)

"DoD, in coordination with the NNSA, will evaluate nuclear weapon options to increase weapon system effectiveness and flexibility and to limit collateral damage. Capability improvements are likely to be needed to correct the limitations of the existing nuclear forces." (p. 49)

## **V. NUCLEAR REDUCTIONS AND IMPLEMENTATIONS FOR ARMS CONTROL**

### **Initial Reductions**

"When these reductions [i.e. retire 50 Peacekeepers, remove 4 Trident SSBNs, and convert B-1's to solely conventional role] are complete in FY06, the number of U.S. operationally deployed strategic warheads will be reduced by about 1,300 warheads accountable under the START I Treaty (based on attribution rules at the time these decisions were made). The four Trident submarines that will be removed from service will remain accountable under the START I Treaty." (p. 51)

"The Department analyzed the role of the Peacekeeper against projected threats in the post Cold War environment and judged that its retirement would not have an adverse effect on the sufficiency of U.S. nuclear forces... Funding has been programmed, beginning in FY03, to retire these weapons in a phased approach to coincide with the Trident D-5 transition to the Pacific fleet and to retain and maintain the silos for future options. These silos, and the four Trident submarines converted to SSGNs, will remain accountable under the START I Treaty."

"Additional strategic nuclear reduction will be achieved by lowering the number of warheads assigned to the operationally deployed force. By the end of FY07, U.S. operationally deployed strategic nuclear warheads should total no more than 3,800. The drawdown of the operationally deployed strategic nuclear warheads will preserve force structure in that, aside from the Peacekeeper ISCBM and the four Trident SSBNs, no additional strategic delivery platforms are scheduled to be eliminated from strategic service. These reductions are to be completed between FY03 and FY07, and will result in approximately a 40% reduction in number of operationally deployed strategic nuclear warheads from the present."

### **Longer Term Reductions**

"With regard to additional reductions beyond FY07, the United States plans to decrease the number of warheads on its ballistic missile force by "downloading." Regarding bombers, reductions will be made by lowering the number of operationally deployed weapons, i.e. those available for loading at operational bomber bases."

"Warheads that will count as operationally deployed are: for ballistic missiles, the actual number of nuclear weapons loaded on the ICBMs or SLBMs; for bombers, those nuclear weapons located in weapon storage areas at bomber bases (except for a small number of spares)."

### **START II Treaty**

"...the Russian resolution of ratification, adopted in 2000, contains unacceptable provision contrary to the new strategic framework and establishment of the New Triad."

### **De-Alerting**

"U.S. forces are not on "hair trigger" alert and rigorous safeguards exist to ensure the highest levels of nuclear weapons safety, security, reliability, and command and control. Multiple,

stringent procedural and technical safeguards are in place to guard against U.S. accidental and unauthorized launch."

"The New Triad addresses concerns about the accidental or unauthorized launch of certain foreign forces. For example, it provides missile defenses to protect the United States, its allies, and friends against limited or unauthorized launches. It also will provide a spectrum of defensive and non nuclear response options to an accidental or unauthorized launch, allowing the United States to tailor an appropriate response to the specific event and to limit the danger of escalation."

"The elimination of the Peacekeeper ICBM will be phased to correspond with the introduction of the Trident II (D-5) missile in the Pacific. As they are eliminated, those Peacekeeper missiles remaining during the elimination process will be kept on alert to provide a necessary contribution to the U.S. portfolio of capabilities." (p. 54)

"Following the initial phase of U.S. nuclear reductions, subsequent reductions will be achieved by downloading warheads from missiles and bombers. Force structure will be retained as the basis for reconstructing the responsive force. Delivery systems will not be retired following initial reductions and downloaded warheads will be retained as needed for the responsive force." (p. 54)

## **The Comprehensive Test Ban**

"The United States has not conducted nuclear tests since 1992 and supports the continued observance of the testing moratorium. While the United States is making every effort to maintain the stockpile without additional nuclear testing, this may not be possible for the indefinite future. Some problems in the stockpile due to aging and manufacturing defects have already been identified. Increasingly, objective judgments about capability in a non-testing environment will become far more difficult. Each year the DoD and DOE will reassess the need to resume nuclear testing and will make recommendations to the President. Nuclear nations have a responsibility to assure the safety and reliability of their own nuclear weapons." (p. 55)

## **Transparency**

"The START I Treaty includes provisions that provide a useful baseline of transparency for offensive strategic forces. Any additional transparency that may be useful to provide added confidence and predictability would be in the form of separate political commitments."