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Plenary Panel: New Military Technology & Control from Space

**Nuclear Weapons; Forgotten But Not Gone
The Nuclear Weapons Laboratories, Missile Defense, and the Weaponization of Space**

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Although the title of this panel is “The *New* Role of Military & Space Technology,” I want to start out by talking about the current role of some “old” military technology that, unfortunately, is still very much with us – nuclear weapons. This “old” technology is fundamentally intertwined with the military and space technology of the future. Some of you may be surprised to know that the U.S. is currently engaged in a massive program to build up its nuclear weapons infrastructure, and is currently designing *more useable* nuclear weapons, hand in hand with other high-tech weaponry. It is important to note that this is not a partisan development; it is a continuation of policies begun under the Truman administration and carried on through every administration since, Republican or Democrat.

On December 30, Mikhail Gorbachev, the last President of the Soviet Union published an open letter to President -“select” George W. Bush in which he boldly warned: “... while America’s role is acknowledged throughout the world, her claim to hegemony, not to say domination, is not similarly recognized. For this reason, I hope, Mr. Bush, as the new American president, that you will give up any illusion that the 21st century can, or even should, be the ‘American Century.’ Globalization is a given - but ‘American globalization’ would be a mistake.... and even dangerous.... For 10 years, U.S. foreign policy has been formulated as if it were the policy of a victor in war, the Cold War.... Need an example? The expansion of NATO eastward, the handling of the Yugoslav crisis, the theory and practice of U.S. rearmament - including the utterly extravagant national missile defense system, which, in turn, is based on the bizarre notion of ‘rogue states’.”²

In fact, ten years after the end of the Cold War, the military-political establishment in the United States has “regrouped” and has fabricated a new set of justifications for retaining nuclear weapons as the core of its “national security” policy, while refining them for greater utility in the changed international context.

Most Americans seem to believe that nuclear weapons simply vanished into thin air when the Cold War ended. Nothing could be further from the truth. According to a 1995 study by a committee of the U.S. Strategic Command:

“Although we are not likely to use them in less than matters of the greatest importance, or

in less than extreme circumstances, nuclear weapons *always* cast a shadow over any crisis or conflict in which the U.S. is engaged. Thus, deterrence through the threat of use of nuclear weapons will continue to be our *top military strategy*.”³

Approximately 2,300 U.S. “strategic” (long range) nuclear warheads remain on hair-trigger alert, ready to instantly target locations around the globe. In fact, since 1995 the number of sites on the target list has *grown* from 2,500 to 3,000.⁴ Land based nuclear missiles are ready to launch their deadly payloads within two minutes. U.S. Trident submarines continue to patrol the seas at Cold War levels, ready to fire hundreds more of the most destructive and precise weapons ever conceived, on fifteen minutes notice. Trident submarines carry two types of warheads. One of them is the 100 kiloton yield W-76. (By comparison, the yield of the Hiroshima bomb was approximately 15 kilotons.) During a June 1999 presentation to Los Alamos National Laboratory employees, Dr. Stephen Younger, the Lab’s top nuclear scientist, explained:

“The W-76 warhead is the backbone of America’s strategic deterrent. There are lots of these things out there. They are out there right now on submarines, submarines moving very quietly. We don’t know where they are. The bad guys don’t know where they are. Thirty minutes, however, and they can deliver this type of weapon to just about any target on earth. Okay? So the moral of that story is: don’t mess with the United States. You think Texas is bad? Try a Trident submarine.”⁵

In addition, approximately 150 U.S. “tactical” (short range) nuclear weapons are still deployed in NATO countries. *Although it’s almost never mentioned, over the past decade the U.S. has threatened the use of nuclear weapons against Libya (April 1996), North Korea (July 1994) and Iraq (1991 and 1998).*

START II, which was ratified by the Russian Duma in April 2000, reduces the U.S. and Russian arsenals of strategic deployed nuclear weapons to 3,000 - 3,500 each. The deadline for treaty implementation, originally 2003, was subsequently extended to 2007. And it is currently stalled in the U.S. Senate. But START II doesn’t deal with “reserve,” non-deployed strategic weapons or tactical nuclear weapons, so even if it is fully implemented, the U.S. plans to maintain an arsenal of approximately 10,500 nuclear warheads, including deployed and reserve strategic and tactical, *for the foreseeable future*. The prospective START III treaty would reduce each side’s strategic deployed nuclear weapons to 2,000 - 2,500 — still a huge number, which will not *qualitatively* make much of a real difference. However, the future of the entire START process, and indeed all arms control agreements, is in jeopardy because of the potential U.S. decision to deploy a National Missile Defense (NMD) system. If the U.S. decides to deploy NMD without Russia’s consent, it will abrogate the 1972 Anti-Ballistic Missile Treaty. In that case, Russia has said it will withdraw from all existing arms control agreements. And NMD and related Theater Missile Defense schemes are so provocative to China, that a Chinese-American arms race may result as well. *In any case, there are no formal nuclear arms control negotiations presently underway.*

Presidential Decision Directive-60 (PDD-60), signed by President Clinton in December 1997, reaffirmed the U.S. policies of threatened first use and threatened massive retaliation, and recommitted the U.S. to nuclear weapons as the “cornerstone” of its national security for the foreseeable future. PDD-60 also contemplates nuclear retaliation against the use of chemical or biological weapons, part of the so-called “counterproliferation” program. Other publicly available government documents indicate that the U.S. military has not ruled out the *preemptive* use of nuclear weapons in such circumstances.

What does the United States *really* mean by “deterrence”? The other type of warhead carried on the Trident submarines is the 475 kiloton yield W-88. According to Dr. Younger:

“[T]he principle of deterrence is to say, ‘You may be able to run, but you can’t hide.’ So we can put a W-88 to very high precision — and it’s a high yield weapon — on a target, and the bad guys know, or ought to know that their hard targets will not survive a weapon of this type. That’s the theory of deterrence: don’t try anything stupid because we’ll get you. Doesn’t matter how much destruction you cause in the United States — *your country is going to go away if you try something dumb.*”⁶

Through a massive program, euphemistically called “Stockpile Stewardship,” new nuclear weapons facilities of unprecedented sophistication are being built, a new generation of nuclear scientists is being trained, and nuclear weapons design and production is going forward. In fact, the U.S. is now spending more than \$5 billion a year on nuclear weapons research, development, testing and production, an amount in constant dollars, well above the \$3.7 billion annual Cold War average for directly comparable activities.⁷ *And that’s just for the warheads, not the delivery systems.*

Under the current moratorium on full scale underground nuclear blasts, nuclear weapons design will be advanced through simulations carried out using superfast computers, coupled with archived data from more than 1000 past tests, and new diagnostic information obtained from inertial confinement fusion facilities, pulsed power and chemical explosive driven pulsed power fusion experiments, and above-ground hydrodynamic explosions, nuclear weapons laboratories, and subcritical “zero yield” underground tests at the Nevada Test Site.

The Stockpile Stewardship program also anticipates building new nuclear weapons production facilities, in order to have the capacity to produce at least 450 new plutonium “pits” a year by 2020⁸ — a number that equals or exceeds the individual nuclear arsenals of China, the United Kingdom, France and Israel. An additional 12,000 pits from dismantled weapons are in storage at the Pantex facility in Texas and available to be used again in the future, if desired, in new warheads. The pit is actually an atomic bomb that serves as the trigger for a hydrogen bomb. The U.S. is also preparing to resume the production of tritium — radioactive hydrogen; the “H” in H-bomb — for the first time since 1988.-

Under the Stockpile Stewardship program, modifications or upgrades — including in some instances enhanced military capabilities — are planned for every weapon type in the U.S. arsenal.⁹ One such modification, the B61-11 gravity bomb already has been developed and deployed without underground testing. The B61-11 is an earth-penetrating bomb with a variable yield (from 300 tons to over 300 kilotons of TNT) — developed *after* the Gulf War — which can be delivered by the B-2 stealth bomber. Using Stockpile Stewardship capabilities, the U.S. weapons laboratories also are developing replacement warhead designs for submarine launched ballistic missiles carried on Trident submarines, although no deployment plans have been made public.¹⁰ Last year, Undersecretary of Energy Ernest Moniz declared: “*Our tools under stockpile stewardship are working so well today that we are not only able to certify safety and reliability... but we are also able to meet new military requirements.*”¹¹

Despite official claims that the U.S. nuclear arsenal is being de-emphasized, research continues in the U.S. nuclear weapons laboratories on new ways to use nuclear weapons against a variety of targets. This includes a current, Congressionally-mandated study on a new generation of weaponry, including low-yield “mini-nukes” for use against hardened and deeply buried targets such as missile silos, stockpiles of chemical or biological weapons or Saddam Hussein’s command bunker. This is an extremely dangerous development, because the military is likely to regard these low-yield weapons as more useable than existing weapon types.

The National Missile Defense (NMD) proposal, to deploy missiles intended to counter missile warheads aimed at the continental United States, has been the subject of extensive criticism due to both its potential to destroy the existing Cold War arms control regime, and unresolved technical issues. But the initial phase of NMD is only a small part of a far broader set of initiatives for weapons and other military systems which would operate through and from space, systems which would to a large extent share a common technology base and infrastructure. The U.S. is expanding funding for development of a wide range of space-based weapons, surveillance, and communications systems including “space-based radar, space-based lasers” and “reusable launch vehicles...”¹²

The Department of Energy (DOE) nuclear weapons laboratories have done BMD work for decades. Lawrence Livermore National Laboratory in California was the birthplace in the early 1980’s of Ronald Reagan’s Strategic Defense Initiative, and the DOE laboratories continue to work on BMD for the Ballistic Missile Defense Organization under a Memorandum of Understanding between DOE and the Department of Defense (DOD).¹³

Sandia National Laboratory, responsible for engineering non-nuclear components for nuclear warheads at its facilities in Albuquerque, New Mexico and Livermore, California, does extensive work for the Ballistic Missile Defense Organization. According to its current Institutional Plan:

“Sandia provides technology in the areas of countermeasures, space technology, pulsed

power, threat definition, smart targets, rocket launch services, reentry vehicle technology, missiles, smart mines, sensors, testing, instrumentation, control technology, radiation hardening, microwaves, and computing. Some support is based on our experience in nuclear weapons design and on the DOE's Inertial Confinement Fusion Program. Sandia also provides technology in the areas of radiation-hardened satellite communications transceivers; flight tests; analysis of strategic defense systems; and development, analysis, and testing of potential countermeasures."¹⁴

It is worth noting that Sandia is managed for the DOE by Lockheed-Martin. The US Committee to Expand NATO was chaired by Lockheed-Martin's Vice-President. NATO's 50th anniversary summit held in April 1999 in Washington, DC was hosted by corporate sponsors including Boeing and Raytheon, who paid up to \$250,000 each to hobnob with the 19 Foreign Ministers in attendance. This took place *during* the US-lead NATO bombing of Kosovo.

The Lawrence Livermore National Laboratory in California and the Los Alamos National Laboratory in New Mexico are managed the University of California. According to the current Livermore Lab Institutional Plan:

"We analyze the capability of various interceptor systems to defend against and negate the effects of ballistic-missile-delivered WMD [Weapons of Mass Destruction]."¹⁵

According to the DOD Space Technology Guide for FY 2000-2001:

"During the past 40 years, Los Alamos has played a significant role in the nation's space program by uniquely combining national security missions with leading-edge investigations of space science and space technology... Among its core competencies, it includes: complex experimentation and measurement; computing theory, modeling and high performance to deal with vast amounts of information; analysis and assessment to support complex models and systems; Earth and environmental systems that address both the near-Earth space environment and remote sensing of the Earth from space; nuclear and advanced materials such as ceramics and exotic polymers; and nuclear science, plasmas and beams that span the study of high-energy/density systems driven by intense beams."¹⁶

Some of the facilities which the U.S. government claims it needs to maintain its nuclear arsenal under the Stockpile Stewardship program, can be used for a wide range of other weapons research. The centerpiece of that program, the National Ignition Facility (NIF), is currently under construction at the Livermore Laboratory. It is a laser driven, inertial confinement fusion machine the size of a football stadium, designed to create for the first time, "nuclear fusion ignition" — very brief, contained thermonuclear explosions. The NIF, which will be forty times larger than any laser in the world today, is likely to have little direct role in maintaining already existing nuclear warheads.¹⁷ It is slated to be used for a wide range of other nuclear weapons

applications, from training weapons designers in nuclear weapons science to nuclear weapons “effects” testing. (That is, testing the effects of radiation and other nuclear weapons effects on weapons components, sensors, and communication satellites.) According to a recently-obtained DOD document, the NIF may be used to conduct “laser/fireball” tests to study low-yield nuclear weapons effects on tunnels and other underground structures.¹⁸ The NIF, in combination with other Stockpile Stewardship facilities also could play a role in the development, over the long term, of pure fusion weapons not requiring plutonium or uranium. This kind of a nuclear weapon would render current verification techniques useless.

The NIF also may prove useful in research on low-yield nuclear interceptors for use against ballistic missiles capable of carrying biological or chemical agents, as well as nuclear warheads. A Livermore Laboratory document describes in technical terms exactly how the NIF might be used for this purpose:

“The U.S. and its allies face a growing threat of ballistic missiles capable of carrying biological/chemical agents or contact/salvage-fuzed nuclear warheads. The limited effectiveness of the interceptors being developed by the U.S. against this threat, using fragments or hit-to-kill vehicles, can be expected to generate increased interest in evaluating the lethality of a low-yield nuclear interceptor option against this threat. NIF provides large fluences of both fusion and fission neutrons with the very short pulse widths characteristic of low-yield nuclear intercepts, that can be used to establish lethal criteria for chemical/biological agents and nuclear warhead targets.”¹⁹

Research conducted at the DOE nuclear weapons laboratories also is relevant to a number of the space weapons concepts currently being explored by the U.S. military. Laser research, for example, has been a major focus at the Livermore and Los Alamos Labs for decades, including use in simulation of nuclear weapons phenomena, efforts to design directed energy weapons as part of the Reagan-era Star Wars program, and use in various weapons fabrication processes. A recent Defense Department study urged more systematic integration of DOE laser research programs into DOD laser weapons efforts, which include the development of a Space Based Laser that could be used for both missile defense and to attack targets on the ground.²⁰

Other kinds of directed energy weapons initiatives are underway at the DOD and DOE laboratories. Military applications of radio frequency and other directed energy weapons envisioned by the Air Force range from weapons for use against chemical and biological weapons to weapons designed to “fry” enemy satellites.²¹

Air Force budget documents show research on “high power microwave (HPM) and other unconventional weapons concepts” to “support a wide range of Air Force missions such as suppression of enemy air defenses, command and control warfare, and vehicle self protection...” These efforts include “assessment of the vulnerability of U.S., NATO, and foreign satellites to the effects of directed energy weapons, primarily high energy lasers and high power microwaves.”²²

The DOE nuclear weapons laboratories collaborate with DOD in these areas as well.

Simply stated, laser and high power microwave research has a broad range of military applications. According to the Air Force FY98 Space and Missiles Technology Area Plan:

“The Space Force Projection Enterprise provides focus and direction to technology investments that address the application of force from and through space to points in space, in the air and on the ground. The scope of this Enterprise is wide and includes leading technology initiatives in areas such as the Military Space Plane, Space Based Lasers and ballistic missile systems. Though current treaty implications limit the actual fielding of weapons in space, low end capabilities providing entry levels of graduated deterrence are needed now. *The technology base required to meet future space weapon needs must be developed and matured today if it is to be available for future warfighter needs.*”²³

Continued modernization of U.S. nuclear forces, in combination with missile defenses and new “conventional” high-tech weapons which may be able to destroy hardened targets like missile silos and command centers, are likely to make Russia and China more reluctant to agree to significant reductions in nuclear arsenals. In this regard, it is important to recognize that enormous, high-technology weapons programs like ballistic missile defense and research on space-based weapons, with their long lead times and their potential for unforeseen weapons innovations, don’t have to be successful in the immediate sense to be destabilizing.

It is also important to recognize that the United States has no plans to reduce the essential character or significance of its nuclear arsenal. U.S. documents supporting Anti-Ballistic Missile Treaty (ABMT) negotiations with Russia last year, summarize arguments intended to persuade Russia that a “limited” U.S. ABM system would not be a threat to its nuclear deterrent. “Talking points” obtained by The Bulletin of the Atomic Scientists state:

“Both the United States and the Russian Federation now possess and, as before, will possess *under the terms of any possible future arms agreements*, large, diversified, viable arsenals of strategic offensive weapons consisting of various types of ICBM’s, submarine-launched ballistic missiles, and heavy bombers.”²⁴

This indicates that the determined pursuit of ballistic missile defenses by the dominant factions within the U.S. military-political establishment is occurring with full cognizance that ballistic missile defenses will make meaningful progress towards the *elimination* of nuclear arsenals impossible. In addition, the close interconnections between research, design and testing of thermonuclear weapons and other forms of advanced weapons research, as described above, could ignite entirely new arms races.

The Russian national security doctrine, released in January 2000, recognized this

possibility, and placed it — correctly — in context:

“The transition of NATO to the use of force (military force) beyond the zone of its responsibility and without the sanction of the UN Security Council, which has been elevated to the level of a strategic doctrine, is fraught with the destabilization of the strategic situation in the world.

The growing technological surge of some leading powers and their growing possibilities to create new-generation weapons and military hardware are creating prerequisites for a qualitatively new stage in the arms race and a dramatic change in the forms and methods of waging hostilities.”²⁵

In conclusion, existing arms control approaches, bound to particular treaty regimes and focusing on narrow classes of weapons systems cannot serve as an analytical framework either for understanding the likely course of future arms races or for forming strategies to prevent them. Moreover, technical critique alone of one or another weapons system is unlikely to have much effect on the general drift towards new and unstable arms races involving a number of participants. The U.S. military and their contractors are working on a wide range of technologies which will be viewed as threatening by a variety of states, ranging from aspiring regional powers to China and Russia. The new U.S. administration has publicly committed itself to a program of high-tech weapons development, and its Secretary of Defense, Donald Rumsfeld, was a key member (until his cabinet appointment) of a government panel which recommended intensive development of military systems in space.²⁶

Civil society must begin to find ways of addressing the relationships among the various high-tech military technologies that threaten to ignite new arms races by re-focusing attention on the enormous influence of the “military-industrial” (and academic) complex. We also must understand that the drive for military supremacy is not happening only at the behest of major corporations, though they are certainly a major influence, but more broadly as a means of projecting pure power, with political, ideological and cultural, as well as economic dimensions.

We must challenge the purposes for which this overwhelming military force is deployed. The stated long-term goal of the U.S. military is to “enable an affordable capability to swiftly and effectively deliver highly effective weapons against targets at any required global location” in order to “affordably destroy or neutralize any target on the earth...”²⁷ Common sense tells us that if every nation on earth pursues such goals, the result will be endless military competition, and in a world of ever more advanced weaponry, endless death and destruction. If we are to avert potentially catastrophic arms racing in the decades to come, arms control efforts will not be enough; we will need a real peace movement, grounded in a commitment to nonviolence and cooperation, which makes both conceptual and organizational connections with emerging movements for social and economic justice and for ecological balance.

There is hope. The Abolition 2000 Global Network to Elimination is one such effort.

Founded in 1995, Abolition 2000 (which works closely with the Global Network Against Weapons & Nuclear Power in Space) has grown to include over 2,000 NGOs and municipalities in more than 90 countries.²⁸ Abolition 2000 is calling for immediate commencement of negotiations to conclude a verifiable treaty on the elimination of nuclear weapons. To this end, a working group of scientists, international lawyers and activists drafted a Model Nuclear Weapons Convention which has been accepted as an official United Nations document and is being circulated within the UN for deliberation. A new Abolition 2000 working group is now developing proposals for a Comprehensive Missile Control Regime as a positive alternative to the illusory techno-fixes of counterproliferation weapons and missile defense.²⁹ Finally, Western States Legal Foundation, in collaboration with the Los Alamos Study Group, Tri-Valley CAREs and the Nuclear Program of the National Resources Defense Council has just launched a pledge campaign for scientists and engineers to renounce work of all kinds of nuclear, chemical and biological weapons and their means of delivery.³⁰ We hope that this pledge will be circulated as widely as possible in the scientific community and on college and university campuses everywhere, which is where weapons work begins.

Thank you.

¹. This speech draws on collaborative research and writing over many years by the speaker and her colleague Andrew Lichterman, Program Director of Western States Legal Foundation. Many of the documents referenced and other related material are available at: www.wslfweb.org

². "Mr. Bush, The World Doesn't Want to Be American," published in the International Herald Tribune, Dec. 30, 2000

³. U.S. Strategic Command, Policy Committee, *Essentials of Post-Cold War Deterrence*, 1995, obtained under the Freedom of Information Act by Hans M. Kristensen

⁴. "Trapped in the Nuclear Math," Bruce G. Blair, The New York Times, Op Ed page, June 12, 2000

⁵. "Why Are Nuclear Weapons Important? The Los Alamos Perspective," remarks by Dr. Stephen Younger, Associate Laboratory Director for Nuclear Weapons, June 21, 1999. Video obtained by Greg Mello, the Los Alamos Study Group

⁶. "Why Are Nuclear Weapons Important?" Dr. Stephen Younger, June 21, 1999

⁷. The U.S. Nuclear Weapons Cost Study Project, *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons Since 1940*, Brookings Institution Press, 1998. See also *National Nuclear Security Administration FY 2001 Funding*, Nuclear Weapons & Materials Monitor, October 16, 2000, p. 3

⁸. *Plutonium-Pit Production in the 21st Century, Salient features of the DPAG [Defense Programs Analysis Group] - prepared for LSPF [Large-Scale Pit Facility]*, workshop on March 21, 2000 (slides), Linda Branstetter, Sandia National Laboratories (documents obtained by Greg Mello, Los Alamos Study Group)

⁹. U.S. Department of Energy Office of Defense Programs, *Stockpile Stewardship and Management Plan*, February 1996, and *Stockpile Stewardship and Management Plan: First Annual Update*, October 1997. See also, Andrew Lichterman and Jacqueline Cabasso, *Faustian Bargain 2000: Why 'Stockpile Stewardship' is Fundamentally Incompatible with the Process of Nuclear Disarmament*, Western States Legal Foundation, May 2000

- ¹⁰. Greg Mello, "That Old Designing Fever," The Bulletin of the Atomic Scientists, January/February 2000
- ¹¹. Quoted in James A. Kitfield, "The Decline of the Nuclear Stockpile," Air Force Magazine, February 2000 Vol. 83, No. 2.
- ¹². Statement of Mr. Keith R. Hall, Assistant Secretary of the Air Force (Space) and Director, National Reconnaissance Office before the U.S. Senate Committee on Armed Services Subcommittee on Strategic Forces, March 8, 2000
- ¹³. National Defense Authorization Act for Fiscal Year 1998, Public Law 105-85, Sec. 3131. Subsection C provides that DOE laboratory activities under the Memorandum of Understanding (MOU) "may include the identification of technical modifications and test techniques, the analysis of physics problems, the consolidation of range and test activities, and the analysis and simulation of theater missile defense deployment problems."
- Legislation pending as of July 2000 proposed a revised MOU between the Ballistic Missile Defense Organization and the new National Nuclear Security Administration, which now administers DOE's nuclear weapons programs. The new MOU would provide for "mechanisms that increase the cooperative relationship between those organizations." It would also allow "jointly funded projects" which "contribute to sustaining-- (A) the expertise necessary for the viability of such laboratories; and (B) the capabilities required to sustain the nuclear stockpile," which would further intertwine nuclear weapons maintenance and development with other high technology weapons initiatives. See Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001, H. R. 4205, Sec. 3132, "Enhanced Cooperation Between National Nuclear Security Administration and Ballistic Missile Defense Organization."
- ¹⁴. U.S. Department of Energy, Sandia National Laboratory, *FY2000 – 2005 Institutional Plan*, pp.114-115
- ¹⁵. U.S. Department of Energy, Lawrence Livermore National Laboratory, *Institutional Plan FY 2000–2004* p.33
- ¹⁶. DOD Space Technology Guide for FY 2000 - 2001, Office of Secretary of Defense, Assistant Secretary of Defense (Command, Control, Communications and Intelligence), p. H-9, available at www.space.gov
- ¹⁷. The argument that extensive nuclear weapons physics ICF experiments are needed to "exercise" the skills of weapons scientists is less relevant to maintaining existing weapons than to retaining the capability to develop new ones. Richard Garwin, an advocate of the "Stockpile Stewardship" program, notes that
- "...[O]nly a portion of the very expensive and controversial National Ignition Facility (NIF), for example, is coupled directly to the stockpile stewardship task, and much of that portion has more to do with maintaining expertise and developing capabilities that would be useful in case the CTB regime collapsed than with maintaining the enduring stockpile of the nine existing weapon designs safely and reliably for the indefinite future." Richard L. Garwin, "The Future of Nuclear Weapons Without Nuclear Testing," Arms Control Today, November/December 1997 Volume 27, Number 8
- ¹⁸. U.S. Department of Defense, Deputy Under Secretary of Defense (Science and Technology), 2000, *Defense Technology Area Plan*, Table XI-5, at p. XI-14. Obtained by Western States Legal Foundation through under the Freedom of Information Act.
- ¹⁹. Lawrence Livermore National Laboratory, *Nuclear Weapon Effects Test Facilitization of the National Ignition Facility*, August 8, 1995, de-classified version, CD-95-0055
- ²⁰. The Space Based Laser program, funded by the Air Force and the Ballistic Missile Defense Organization (BMDO), aims at designing laser platforms with global reach to provide "a global boost phase intercept option for both national and theatre missile defense" as well as "many ancillary capabilities, including air defense, global surveillance, and target detection and designation for other systems." BMDO RDT&E Budget Item Justification,

Advanced Technology Development, Space Based Laser, PE 0603174 (February 2000). See also U.S. Air Force RDT&E Budget Item Justification, *Advanced Technology Development, Space Based Laser*, PE 0603876F, February 2000

²¹. U.S. Air Force Materiel Command, Directorate of Science and Technology, *FY97 Directed Energy Technology Area Plan*, pp ii, 18,21

²². U.S. Air Force RDT&E Budget Item Justification, *Applied Research, Directed Energy Technology*, PE 0602605F, February 2000

²³. U.S. Air Force Materiel Command, Directorate of Science and Technology, *FY98 Space and Missiles Technology Area Plan*, p.ii. (Emphasis added).

²⁴. “Proposal on ABM: ‘Ready to Work with Russia,’” *The New York Times*, April 28, 2000, p. A10 (emphasis added). The document quoted from was a document “that American negotiators have presented to the Russians with proposals for amending the 1972 ABM treaty, in order to allow the United States to build a limited national missile defense system.” *id.* These documents were obtained originally and provided to the *Times* by *The Bulletin of Atomic Scientists*, and can be found in full on their web site at www.bullatomsci.org/issues/2000/mj00/mj00schwartz.html

²⁵. *National Security Concept of the Russian Federation*, full English translation from *Rossiiskaya Gazeta*, January 18, 2000, Approved by Presidential Decree No. 1300 of 17 December 1999 (given in the wording of Presidential Decree No. 24 of 10 January 2000, emphasis added).

²⁶. See *Report of the Commission to Assess United States National Security Space Management and Organization Pursuant to Public Law 106-65* January 11, 2001, www.space.gov/commission/report.htm

²⁷. U.S. Department of the Air Force, *The Air Force Science and Technology Plan for Fiscal Year 2000*, p.22

²⁸. Abolition 2000's web site can be found at: www.abolition2000.org

²⁹. “Reconsidering a Comprehensive Missile Control Regime: It’s Not Too Soon,” Andrew Lichterman, Western States Legal Foundation Working Paper, Winter 2001. Available at: www.wslfweb.org

³⁰. The Scientists’ and Engineers’ Pledge to Renounce Weapons of Mass Destruction is available on line at: www.lasg.org/pledge/ and at www.wslfweb.org