

Statement by
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Before the
U.S. Senate Armed Services Committee
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Mr. Chairman, I'm pleased to appear before you and the other distinguished members of the Committee to address key considerations facing the Congress in deciding the future of the Comprehensive Test Ban Treaty. With your permission, I'd like to make my statement a part of the record.

A foundation of U.S. Defense policy since the end of World War II has been the necessity for a stockpile of nuclear weapons to deter those countries that might become our adversaries, either against the United States or our allies. When you compared the loss of life in terms of the world population in warfare in the last century and first half of this bloody century before World War II (about 2-3 percent) to the loss of life after World War II (.1-.2 percent), it's obvious there was fundamental change. I believe a key element that enhanced the deterrence stability between superpowers in the post-World War II era of the Cold War was the presence of nuclear weapons in the arsenal of the superpowers. These highly destructive weapons stimulated both sides to more aggressively work to peacefully resolve problems vice result to warfare. Thus, at an unprecedented level during the Cold War, we negotiated with the Soviet Union, established means for communication, and sought to control the escalation of direct confrontation.

To guarantee our freedoms in the future, I believe that it will be essential to retain a safe and reliable nuclear weapon stockpile even though our conventional military force has become the most powerful in the world compared to our competitors. There is no sign that other countries with substantial numbers of nuclear weapons are moving to eliminate this capability. Even if they did, the availability of technology would necessitate that the U.S. retain these weapons. The world remains a dangerous place, and we're reminded of George Washington's admonition, "The most effectual means of keeping the peace is to prepare for war."

There is a common belief that elimination of nuclear device testing through a comprehensive test ban is an effective deterrent to acquisition of nuclear weapons by rogue states and terrorist groups even if they acquire fissile material. This is dubious. The testing of nuclear devices is not necessarily a requisite step to a credible nuclear force. Early nuclear devices were developed without testing. The obvious example is Little Boy, the first U.S. nuclear weapon used. Crude nuclear devices could be designed and built today without testing. On the other hand, it is true that by restricting nuclear tests a nation would have difficulty initiating development of sophisticated nuclear devices or an effective military deterrent force in which they would be likely to place high confidence for ensuring their overall security.

The safety and reliability of the United States nuclear weapons depend on many factors. These include (but are not limited to) regular inspection of weapons, preventive maintenance, tests of

non-nuclear components, replacement of components when necessary, modeling of performance, studies of material aging, independent reviews, and retention of a dedicated body of skilled scientists, engineers, and technicians. The Stockpile Stewardship Program (SSP) brings the different aspects of nuclear weapon responsibilities together. SSP is an absolutely necessary program. We are not certain that it is sufficient in an era without nuclear testing. Accordingly, ratification of the Comprehensive Test Ban Treaty (CTBT) poses the following difficulties:

- a. Over time we will have to replace most or all of the non-nuclear components in these weapons with newly designed components since relatively few of the internal components are available, they were originally manufactured using technologies that are now obsolete and are not supported by the evolving industrial base. Without testing, the assurance of safety and reliability of these devices could be suspect after replacement of a number of internal components. No other engineering unit of comparable complexity would be undergo wholesale component reengineering without being fully tested for certification. Sequencing this component replacement work requires a detailed Service Life Extension Program (SLEP) plan, which to date is insufficient for long term planning especially at production facilities. Work to upgrade this SLEP is ongoing by Defense Programs.
- b. Furthermore, our past nuclear testing replicated the hostile environments in which the weapon could be expected to move or function (fratricide, preemptive strike, ABM defenses) with extensive weapon effects tests to ascertain the overall impact on functionality of components and prototype systems. It is unclear how this testing would be conducted in the future on an entire weapon with new components.
- c. Properties of material aging are not fully understood. In this program we have not kept these devices in the stockpile for the length of time we envision as necessary today. Accordingly, we are in now or headed for the "twilight zone." The Stockpile Stewardship Program is focused to investigate these properties.
- d. New personnel are necessary to replace the population of scientists, engineers and technicians who served us so well during the Cold War and subsequent years. In twenty years there will be little or no nuclear testing experience in the Defense Programs workforce. To date, there has been insufficient effort to implement a Defense Programs plan to replenish that workforce, ensure that critical skills will be preserved in the long run, and maintain all aspects of nuclear testing capability.
- e. The current stockpile is evaluated as safe and reliable by those responsible. However, we cannot count on that assessment in the future and indeed should expect far reaching stockpile questions as we mature the Stockpile Stewardship Program over the next 7-10 years. Furthermore, as our current generation of experienced scientists and engineers retire from the workforce and turn over the responsibility for stockpile assessment to the next team, there is legitimate concern that the new generation will be sufficiently trained and experienced to technically certify the stockpile. We cannot afford loss of essential competencies and facilities (including test facilities).

f. Simulation and modeling capabilities have limitations. There are extreme radiation fields and severe mechanical distortions inherent in detonation of these weapons. Our analytical models for nuclear detonations have unexplained empirically derived factors. Eventually, despite the best efforts of stockpile stewardship we may have to test to resolve design issues for new components and materials.

g. The President's six safeguards do not appear to be codified in ratification language (I may be mistaken here), and they should be if the CTBT is ratified. Furthermore, without adequate funding to accomplish these safeguards they are meaningless. I am also concerned that laboratory officials will be asked to make technical judgements concerning the weapons in the annual assessment that satisfy external pressures to avoid nuclear testing. The Congress should require that disagreement concerning certification of any weapon in the annual assessment be reported to the Congress.

h. Experimental activities that are permitted by the treaty should be identified to avoid confusion on the definition of "zero yield." The goal should be to permit non-nuclear explosive stockpile stewardship activities and other non-weapon nuclear experiments. Similarly, designers should be permitted to engage in weapon design efforts for training and infusion of new ideas.

Verification of compliance with the Comprehensive Test Ban Treaty is an inexact science. We cannot be sure of our capability to detect worldwide low yield nuclear detonations despite extensive effort, technology improvement, and international cooperation.

Mr. Chairman, my insights are largely derived from work on the Commission on Maintaining United States Nuclear Weapons Expertise, which reported to you in March 1999. I deeply appreciate your support for the work of our Commission. To summarize. The Stockpile Stewardship Program execution must mature. A meaningful Stockpile Life Extension Program needs implementation for long term sustainment. Personnel initiatives should be enacted to rejuvenate the workforce of scientific, engineering and technical personnel. We must figure out how to test the weapons when they are rebuilt with new components. Verification problems need resolution. Mr. Chairman, in all good faith, I do not believe it is in the United States best interests for the Senate to ratify the Comprehensive Test Ban Treaty at this time.

Finally, it is recommended that Congressional oversight of the nuclear weapons program be reinvigorated. During the Cold War, the Congress took a major role in oversight and support of nuclear weapons. That emphasis on the broader program was lost with the demise of the Soviet Union. A focused and structured oversight by knowledgeable Congressional committees or sub-committees is especially important today during the implementation of the Stockpile Stewardship Program and reorganization. Reinvigorated, organized, Congressional oversight will strengthen the program and reinforce the public service character of the mission as vital to the supreme national interest.