

**The Nuclear Non-Proliferation Treaty and Nuclear Power Workshop on
Enhanced Proliferation Resistance and Safeguards Technology for Nuclear Energy**

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Ambassador Thomas Graham, Jr.

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Disarmament, arms control is not a new issue. In 1139, at the Second Lateran Council, Pope Innocent II, outlawed the crossbow declaring it to be “hateful to God and unfit for Christians”. However, the crossbow was soon overtaken in effectiveness by the English longbow which in turn was eclipsed by the destructive firepower of the cannon. Military technology continued to develop at a faster and faster pace over the centuries.

But everything changed in 1945 with the advent of the atomic bomb, for the first time humankind possessed a weapon with which it would destroy itself. Disarmament efforts gradually gained momentum and over time a web of international treaties and agreements was constructed which limited weapons development and inhibited the spread of nuclear weapons.

And it is important to remember that nuclear weapons truly are a thing apart. The atomic bomb used against Hiroshima in 1945 was 14 kilotons. But in a few years, the United States and the Soviet Union were testing nuclear weapons in the megaton range. And soon a vast nuclear arms race was underway. The Soviet Union built 45,000 nuclear weapons and the United States built more than 30,000. This effort eventually bankrupted the Soviet Union, and cost the United States in excess of 5.5 trillion dollars. But, in the 1960s, it appeared as if those weapons might spread all over the world. In 1962, there were reports estimating that there would be 25-30 nuclear weapon states with nuclear

weapons integrated into their national arsenals by the end of the 1970s. If this had happened, there could be as many as 50 nuclear weapons states today. The International Atomic Energy Agency (IAEA) not long ago estimated that 60-70 nations now possess the ability to build nuclear weapons. If this had happened, a truly nightmarish world would have been created, a world in which every conflict would run the risk of going nuclear, a world in which it would be impossible to keep nuclear weapons out of the hands of terrorists because they would be so widespread, a world in which the continued existence of our civilization would be in the balance every day.

The principal reason that this did not happen, in my judgment, was the negotiation of the Nuclear Non-Proliferation Treaty (NPT) in 1968, its entry into force in 1970, and its permanent extension in 1995. The NPT converted what had been an act of national pride (the acquisition of nuclear weapons) into an act of international outlawry. In exchange for the then five nuclear weapon states agreeing to certain nuclear arms control and disarmament commitments, virtually the rest of the world has agreed never to acquire nuclear weapons. To see the difference, review the headlines in French newspapers in 1960 when France detonated its first nuclear weapon “Vive La France” and contrast that to India’s first nuclear explosion in 1974, which they conducted figuratively in the middle of the night, for which they received world-wide condemnation, and which they were forced to designate as a “peaceful explosion”.

But, the NPT came at a price in arms control commitments for the nuclear weapon states, most importantly, a comprehensive nuclear test ban treaty, a pledge never to use nuclear weapons against non-nuclear weapon NPT parties, a termination in production of fissile material for weapon purposes and deep reductions in nuclear

weapons leading to their eventual elimination. These commitments derive from Article VI of the NPT. But there is another part to the “basic bargain” that underlies the NPT. It is the commitment of the NPT nuclear weapon states to share the benefits of peaceful nuclear technology with the NPT non-nuclear weapon states parties found in Article IV of the Treaty. *↳ NPT 1995*

When the NPT was signed in 1968, it had been 15 years since the announcement of President Eisenhower’s Atoms for Peace program in 1953 which led to the founding of the IAEA. The IAEA has always had the dual role of safeguarding against nuclear weapon proliferation and promoting the peaceful use of nuclear technology. And the non-nuclear weapon states involved in the negotiation of the NPT in the 1960s were intent on ensuring that the NPT in no way impinged on the development and sharing of the peaceful use of the atom. Indeed, one of the reasons that Germany, Italy and Sweden were unwilling in 1968 to make the NPT a permanent treaty—as with all other arms control treaties—but only a 25-year term to be renewed in 1995, was concern over the safeguard system to be administered by the IAEA under the NPT and whether the system would have a negative effect on commercial nuclear power. This concern persisted after entry into force of the NPT in 1970, and in part, led to the Voluntary Offer Agreements between the various NPT nuclear weapon states and the IAEA by which first the United States and gradually the others agreed to permit IAEA safeguards on their nuclear facilities which were not related to national security. Such safeguards, of course, are mandatory under the NPT for non- nuclear weapon states parties but not for the nuclear weapon states parties as they already possess nuclear weapons. And it should be noted that some today question the commitment of Iran to its NPT obligations in part as a result

of recent revelations about uranium enrichment facilities under construction. Iran is, of course, subject to full IAEA safeguards but concerns persist which weaken the credibility of the NPT safeguard system. This situation points up the importance of doing everything we can to enhance the NPT regime, including its safeguard system.

Thus, international cooperation in the development and utilization of peaceful nuclear technology, particularly nuclear power production, is a central part of the NPT regime. And the overreliance by the world economy on fossil fuels and the coming rapid industrialization of the third world, particularly, China and India, means, in my judgment, that a healthy nuclear power industry will be essential to the effective and successful development of the international economic system. Such industrialization in the third world, if we are to avoid choking ourselves to death, simply cannot be based on fossil fuels alone. Indeed, it has been predicted that 3,000 nuclear power stations are going to be built in the next 30 years, world-wide.

But for nuclear power to play its proper role in the world economy, it must be completely separated from weapons. As Prime Minister Blair of the United Kingdom, President Chirac of France, and Chancellor Schroeder of Germany stated in their joint op-ed article supporting United States ratification of the Comprehensive Test Ban Treaty in the *New York Times* of October, 1999 “nuclear proliferation will remain the principal threat to world safety” in the twenty-first century. There are now 435 operating nuclear power plants in 31 countries. As of 2002, 30 new light-water nuclear power reactors are under construction. Twenty percent of the world’s energy is presently generated by nuclear power. During the Cold War, 200-265 metric tons of weapons grade plutonium was accumulated by the United States and Russia, as well as many hundreds of tons of

highly enriched uranium, the other primary nuclear explosive. Indeed, a former minister of Atomic Energy of Russia declared a few years ago that during the Cold War, the Soviet Union had built 45,000 nuclear weapons and made enough fissile material for 90,000 more. Smaller amounts of fissile material exist in the United Kingdom. France, China, India, Pakistan, Israel, and likely North Korea.

But, what should be done?

First and foremost, vigorous efforts to halt production of fissile material and eliminate as much as possible of the material that exists need to be pursued. While the United States ceased production of weapon grade plutonium in 1992, Russia continues to produce around two tons a year. Several years ago, the United States and Russia agreed to a program of blending down 500 metric tons of highly enriched uranium coming from Russian weapons to reactor grade enriched uranium to be sold to utilities. This agreement is proceeding ahead. In 1997, the United States and Russia agreed to dispose of 68 metric tons of plutonium by consuming it in mixed oxide power reactor fuel. This program is still in its early stages.

Second, the IAEA safeguard system needs to be strengthened as I mentioned earlier. In 1997, the NPT parties negotiated a new model protocol to be an additional protocol amending the NPT Parties Safeguards Agreements with the IAEA. This Protocol would give broader and more effective inspection and verification rights to the IAEA. There would be more authority to conduct inspections throughout the territory of a NPT state party and new verification capabilities would be recognized and authorized—such as environmental sampling of river waters to detect clandestine facilities operating upstream. Some 60 NPT parties signed the Additional Protocol, but as of the end of 2002

only some 18 NPT parties had ratified it. The United States should ratify the Protocol and lead a world-wide effort to gain it broad adherence.

Third, efforts need to continue to safeguard and store spent fuel produced by power reactors utilizing conventional fuel designs which, of course, contain plutonium which can be separated. The increasing inventory of reactor spent fuel should either be safely stored in facilities such as in the United States Government Yucca Mountain Project, or chemically reprocessed and the plutonium used to produce electricity. The Government should pursue policies so that there is no need for reactor spent fuel to be indefinitely maintained in storage sites at power stations.

Fourth, reactor grade plutonium that has already been separated and is accumulating should either be eliminated or used to produce electricity, and thereby consumed pursuant to a developed plan, likewise not indefinitely stored.

Finally, the technology is now at hand to develop and make available a more proliferant resistant fuel cycle, including new types of reactor fuel and further down the road more proliferant resistant reactors.

Two examples I will mention, but there are many other concepts being examined in research institutions and laboratories around the United States, and around the world.

The first is a new design of thorium based reactor fuel being developed in Russia by Thorium Power, Inc. Among other benefits, the spent fuel generated by power reactors using this new fuel design would be 45 percent less in weight and 75 percent less in volume than current nuclear fuels, and it has a 90 percent reduction in long-term radio toxicity. Most importantly, this fuel design is compatible with existing commercial

nuclear power plants, and the waste product from this fuel design contains very little plutonium, and none that is separable by chemical reprocessing.

A second new technology concept under development is the pebble bed reactor of General Atomics, Inc. Once built and operating it will have a fuel cycle that will provide improved safety and non-proliferation benefits. The high burn up of the gas reactors make it more proliferation resistant than light-water reactors. Because of the high burnup, isotopes of plutonium are produced that make it extremely difficult to use for a weapon.

These are but two of the concepts and processes being addressed by this Workshop. This is wholly-consistent with the objectives and purposes of the NPT to prevent the further proliferation of nuclear weapons, and at the same time, make the benefits of the peaceful atom available to all countries.