

Nuclear Disarmament: Challenges, Opportunities, and Next Steps

In response to the threat of nuclear arms proliferation, many countries have joined together and signed several treaties to control further spread of nuclear weapons. Some of these treaties include the Anti-Ballistic Missile (ABM) treaty, in which the United States and the Soviet Union agree that each country may have only two ABM deployment areas, and that they cannot provide a nationwide ABM defense or become the basis for developing one. The (ABM) treaty was signed at Moscow, May 26, 1972. The Strategic Arms Reduction Treaty (START), signed on July 31, 1991, which eliminated heavy intercontinental ballistic missiles (ICBM's) and all other multiple-warhead ICBM's, and also reduced the total number of strategic nuclear weapons deployed by both countries, the Comprehensive Test Ban Treaty (CTBT), which was signed on September 24, 1996, prohibits any nuclear explosions, either for peaceful or weapons purposes[1], as well as the Non-proliferation Treaty (NPT), which is the cornerstone of global security. The NPT was put in to effect on March 5, 1970 to prevent the spread of nuclear weapons to additional countries while ensuring access to peaceful nuclear technology. This treaty forbids states that are members of this treaty (United States, Russia, United Kingdom, France, and China) that do not have nuclear weapons from developing them, and also forbids the member states with weapons from transferring them to any other state. The treaty also reassures society through the application of international safeguards that state that peaceful nuclear programs in Non Nuclear Weapons States will not be used for nuclear weapons or any other nuclear explosive devices, and it also commits states that are members to help end the race for nuclear arms and to achieve nuclear disarmament[2].

Many organizations have been formed to combat the spread of nuclear weapons. The International Atomic Energy Agency (IAEA), which was started in 1957 and strives for the safe, secure and peaceful uses of nuclear science and technology. The IAEA plays a key role in contributing to international peace and security [3]. The Nuclear Regulatory Commission (NRC), which was created as an independent agency by Congress in 1974 to enable the nation to safely use radioactive materials for beneficial civilian purposes while ensuring that people and the environment are protected. The NRC regulates commercial nuclear power plants and other uses of nuclear materials, such as in nuclear medicine, through licensing, inspection and enforcement of its requirements[4]. The United Nations (UN), which was created on October 24, 1945, fights to gain international peace and security, help in economic and social development, and to preserve human rights, and play a key role in the security of nuclear energy usage[5]. These are some of the agencies created for the safe use of nuclear energy.

Citations for Objective 1

[1] (Arms Control Agreements) maintained by Steven Aftergood and created by John Pike. Updated September 2005. <http://www.fas.org/nuke/control/>

[2] (What is the Non-Proliferation Treaty?) created by the Center for Nonproliferation Studies(CNS). Updated 2004. http://www.nti.org/h_learnmore/npttutorial/chapter01_02.html

[3] (Pillars of Nuclear Cooperation) created by the International Atomic Energy Agency(IAEA). Updated 2008. <http://www.iaea.org/OurWork/index.html>

[4] (About NRC) created by the Nuclear Regulatory Commission(NRC). Updated January 2009. <http://www.nrc.gov/about-nrc.html>

[5] (The United Nations: Organization) created by the United Nations(UN). Updated October

Many countries have begun forming nuclear energy programs, some for peaceful purposes and some for military or terrorist purposes. Pakistan is mostly nuclear powered already, while Egypt, Saudi Arabia, Turkey, and Iran have taken a major interest in nuclear energy. Close surveillance prove that Egypt, Turkey, and Saudi Arabia's programs are for electricity and peaceful purposes, the Iranians claim that their program is peaceful, but no one knows for sure. These countries have become extremely wealthy, due to the oil strikes in the middle east. While they produce more than enough oil to support their own needs, almost all of it goes into exports. This overabundance of oil leaves these countries with tons of money, with which they could construct nuclear power plants and purchase the nuclear materials needed. Then, the nuclear power is extremely cheap and leaves them some of the richest countries in the world. They can then use this wealth to gain power in the world market.

However, while these countries are very wealthy, these are only a few of the many countries in the Asia, Africa, and Middle East region. India, Ethiopia, Indonesia, and other third world countries, do not have the money to start a nuclear program. These countries borrow or receive grants of money from richer countries to build nuclear power plants. These countries, however do not possess the technology or military power to safely store and protect the plutonium created by the nuclear power plant. This would allow terrorist organizations to take material from these plants and build nuclear weapons.

Nuclear proliferation in these areas would greatly affect the stability of these regions. Strong rivalries have existed in the middle east for thousands of years, and civil wars erupt on a regular basis. As a result, other countries must assume that some of these countries programs will lead to the production of weapons of mass destruction (WMD's). For example, Iran has stated many times that if given the chance, they would eradicate Israel. Russia backs Iran with financial support for the Iranian's nuclear program. Israel's closest, and possibly only, ally is the United States. Let's say, hypothetically, that Iran uses the plutonium from their nuclear programs to produce WMD's, they then attack Israel; Israel strikes back and Russia, in defense of it's financial investment, attacks Israel. Then the United States steps in to defend Israel, and just like that, World War Three starts[1].

As the prices rise and fossil fuels become more and more scarce, the United States is starting to take serious consideration in using even more nuclear power. Nuclear power is a low cost, low emission alternative for fossil fuels. Nuclear power plants rely on heat that occurs during nuclear fission, to heat water into pressurized steam to drive turbine generators when an atom splits in two, from elements like uranium and plutonium.

Many countries have already turned to nuclear energy. In France-77% of its energy is nuclear powered, in Lithuania- 65%, and in the U.S.- 20%.

Nuclear energy is safer on nearby populations as well on the environment. Nuclear energy doesn't release as many harmful gasses into the air as fossil fuels. Coal and natural gas emit carbon dioxide, which contributes to climate change, which is a major cause for global warming. CO₂ emissions from nuclear power plants are minimal[2].

Citations for Objective 2

[1] (A Nuclear Awakening in the Middle East) created by Claude Salhani. Published September

16, 2008.

http://www.metimes.com/International/2008/09/16/a_nuclear_awakening_in_the_middle_east/9763/

[2] (How Nuclear Power Works) created by Marshall Brain and Robert Lamb. July 2008.

<http://www.howstuffworks.com/nuclear-power.htm>

Many people resent the idea of nuclear power plant near their home. The risk of an accident, such as Chernobyl and Three Mile Island, contamination of natural resources, and the threat of nuclear terrorism, have many citizens worried.

The benefits of a nuclear power plant nearby, would be: cheaper electricity due to the massive amounts of plutonium and uranium available, cleaner air, because of the reduction of CO₂, extremely low management cost, and more money for the city from the lease of land for the plant to be built on.

On the bad side, however, you have the cost of construction, and as previously stated, the risk of nuclear terrorism, and the risk of accidents. While a power plant can't explode like a nuclear bomb, a meltdown would cause a smaller explosion and spread nuclear waste and radioactive material all over the surrounding area.

While the risk of accidents in nuclear power plants is very small, they are an important factor to consider. If a piece of machinery malfunctioned, the temperature of the core would rise, and pressure would build, until a meltdown took place. Another factor that can cause a meltdown is simple human error. Take Chernobyl for example. The plant was built quickly and sloppily by the Soviet Union in 1966, as a desperate attempt to keep up in the race for nuclear arms. It was poorly maintained and safety guidelines were disregarded. On April 26, 1986, the plant exploded, releasing more radioactive material than 200 times the Hiroshima and Nagasaki bombs. The fallout from the blast spread all over Europe. In fact, for a few years, the radiation levels in Scotland were 10,000 times the normal[1].

While most nuclear material would go into energy programs, there are quite a few other ways to use that material. Nuclear medicine is very important. Nuclear treatments are the primary means to fight man's most dreaded disease, cancer, along with various other uses.

Nuclear medicine uses radioactive substances(uranium, plutonium, and hydrogen) to, harmlessly, image the internal body(x-rays, MRI's, CAT scans, and ultrasound), to scan and treat diseases, such as the previously stated cancer, tumors, aneurysms, and blood cell and organ disorders. Doctors use computers, detectors, and radioactive substances to look at both the physiology and anatomy of the body in establishing diagnosis and treatment. Some methods are internal treatments such as radioactive pills and injections(radioisotopes, radioactive tracers), or external treatments such as radiation therapy, in which they dose the body with small amounts of radiation[2].

While everyone would like for these to be the only use of nuclear materials, sadly, there are hundreds, if not thousands, of terrorist organizations who would use these materials to build WMD's. As of 2003, at least 3, 700 metric tons of fissionable material, such as (HEU) and plutonium, exist in both civilian and military stockpiles in about 60 countries around the world. If fallen into the wrong hands, this could be used to produce a massive amount of dirty bombs.

In June of 2004, the IAEA's director general, ElBaradei appointed a group of international experts from 26 different countries to study and come up with possible multilateral approaches to reduce nuclear proliferation. The five approaches they came up

with are:

- A. Reinforce existing commercial market mechanisms on a case-by-case basis.
- B. Use the IAEA as a guarantor of international fuel supply.
- C. Promote voluntary conversion of existing facilities to multilateral nuclear approaches.
- D. Create multinational and regional multilateral nuclear approaches for new facilities.
- E. Develop new nuclear fuel cycles under multilateral control, by region or continent[3].

Citations for Objective 3.

[1] (Nuclear Disasters and Accidents) created by Thinkquest 98, Team 17940. Updated 1998.
http://library.thinkquest.org/17940/texts/nuclear_disasters/nuclear_disasters.html

[2] (How Nuclear Medicine Works) written by Craig Freudenrich Ph.D. written October 2008.
<http://www.howstuffworks.com/nuclear-medicine.htm>

[3] (The Nuclear Fuel Cycle) created by Nuclear Files. Updated 2005.
<http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/proliferation/fuel-cycle/index.htm>