Two Case Studies of Environmental-Security Connections

A Presentation at the Environmental Grantmakers Association Meeting Panel:

"Overlooked at Our Peril: Why Military/Security Policy Is EGA's Business"

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My presentation will consist of two case studies that show the intimate connection between environmental problems and military/security questions.

1. Oil, environment, and security
2. Nuclear weapons, proliferation, and environmental contamination.

1. Oil, environment and security

At first sight the acts of terror committed on September 11, 2001 do not appear to be linked to oil. But they are. The link arises from the historical accident that the largest resources of oil on the planet are in Saudi Arabia, which is also the land with the two most holy sites of Islam. U.S. troops have been based there, uneasily, since the 1991 Gulf War. That has been the source of much anger in the region. It appears that many or most of the hijackers were from there, as is the person who seems to have financed and inspired them.

A great deal of violence has historically been associated with oil. Much of World War II was about oil. For instance, the Japanese attack on Pearl Harbor came after the U.S. imposed an oil embargo to prevent Japan from getting access to and eventual control of Indonesian oil, which belonged neither to Japan, nor to the United States, nor to the Dutch colonialists who then ruled Indonesia. As another example, the CIA-supported overthrow of an elected government in Iran in 1953 (in reaction to nationalization of the Iranian oil industry) and its replacement by the Shah of Iran led to two and a half decades of repression in which substantial dissent was only possible in the mosques. The process was central to the dynamic that led up to the 1979 Islamic revolution in Iran.

Several past military crises, with nuclear implications have been around the question of oil: Iran right after World War II, Lebanon-Iraq in 1958, the Israel-Egypt war and the associated Arab oil embargo in 1973, and the 1991 Gulf War. There has been much great power rivalry in the region, dating back to Victorian and Czarist times. One British and U.S. goal in modern times, for instance, was to prevent the Soviet Union from gaining access to an Indian Ocean warm water port in a region or a strong political foothold so close to the world's largest oil reserves. Much of the mess in the region, including some of the motivation for the U.S. support of the Islamic opposition to the Soviet intervention in Afghanistan at the end of 1979, had that as a motive.

In the present crisis, the politics of Central Asia, the Caspian region, the Caucasian region, and the

Middle East, are becoming ever more tangled with the politics of terrorism and with the nuclear politics of Pakistan and India. Of course, this is in addition to the old-time nuclear powers, the United States, Russia, and China, who are present in the region. U.S. policy in Central Asia, like that of the other major powers, is closely tied to the immense oil and gas resources in the region. Now the U.S. has troops in that region. (For a fine, recent analysis of Central Asian oil resources and U.S. policy see Michael Klare, Resource Wars: The New Landscape of Global Conflict. New York: Metropolitan Books, 2001). The U.S. military presence in Central Asia is already showing signs of becoming prolonged, in the same manner as that in Saudi Arabia after the Gulf War. According to recent news reports, the United States has made a long-term security agreement with the government of Uzbekistan, which is, by all accounts, a repressive one that has violated human rights. This could become a bone of contention between Russia and the United States, adding to the danger and complexity of the present crisis in the region.

Oil, of course, is also at the center of the global warming problem. Roughly half the emissions of carbon dioxide emissions from fossil fuels are attributable to oil. Most urban air pollution comes from motor vehicles. Much of the pollution of the oceans comes from oil spills, both routine and accidental.

Are we condemned to these severe security and environmental problems unless we eliminate oil consumption and replace it by efficiency and renewables? I don't think so. The security goal as regards oil is actually somewhat easier than addressing the greenhouse gas problem in its entirety. Reducing world oil consumption by 20 percent, which would amount to about 15 million barrels a day, through mileage standards and the like, would eliminate the political leverage of the Persian Gulf without eliminating the revenues of the countries in the region. This can be done in a decade, if pursued with the determination, on a worldwide basis, and probably with less resources than are now being devoted to war. And it would save a lot of lives – from reduced lung disease to reduced casualties, civilian and military, in the battlefield.

Were the security arguments for reducing oil consumption to prevail – and they are currently the most powerful ones – the benefits for the environment would, of use be immense. In fact, if the West and Japan were to reduce their petroleum consumption by 20 percent in ten years, it would approximately correspond to the fulfillment of their Kyoto Protocol targets. With security as the leading edge, there is now a better prospect for energy policies that would achieve other environmental goals as well, notably the creation of distributed electricity grids. My next case study shows that benefits can also flow from environmental work to the security arena.

2. Nuclear weapons, proliferation, and environmental contamination

I'll use two examples to illustrate the connections between these issues. The first deals with water contamination and regulatory questions related to nuclear weapons production and nuclear waste management. The second deals with plutonium processing.

A. Water contamination

(i) Plutonium in the water: More than a ton (literally) of plutonium, enough to make 200 bombs, and other radioactive materials were packed in cardboard boxes, drums, and wooden boxes and dumped in unlined trenches over the in the Snake River Plain aquifer, the largest aquifer in the Northwest. Some of the water on site is already contaminated well above drinking water standards. The U.S. Department of Energy

(DOE) is not remediating the dumps, but spending over $5 billion a year on new weapons design, laboratory testing of nuclear weapons, and plutonium component testing (without nuclear explosions) underground in Nevada.

(ii) Tritium in the water: Tritium (T) is a radioactive isotope of hydrogen. Being chemically identical to hydrogen, it can replace one of the regular non-radioactive hydrogen atoms in water, H2O, making the water radioactive, HTO, or tritiated water. This water behaves like ordinary water in the human body and in ecosystems and hence becomes part of human cells, food, DNA….Tritiated water, HTO, like H2O, can cross the placenta and irradiate the developing fetus. It is a widespread pollutant resulting from nuclear weapons production (and also from nuclear power, especially from the Canadian heavy water reactor design). For instance, the Savannah River has tritium contamination from the Savannah River Site, in South Carolina. Remedial action is weak, in large measure because it is difficult. While the water is well within the allowable contaminant limit for drinking water, it is important to note that tritium standards are set not for developing fetuses or pregnant women, but for “standard man” – literally a 154-pound male. Like other radioactive materials, the maximum contaminant limit goal is zero, since the best evidence indicates that every increment of radiation produces additional cancer risk. With some radioactive materials the dangers are, I believe, considerably greater than reflected in present day regulations. Several radioactive materials — tritiated water, radioactive cesium isotopes, radioactive iodine isotopes, strontium-90, and carbon-14 — mimic non-radioactive materials the body needs. They all cross the placenta easily. Moreover, the synergistic effects of substances like tritiated water with non-radioactive toxics are essentially unknown. The Department of Energy now proposes to produce tritium for use in nuclear weapons in commercial nuclear reactors belonging to the Tennessee Valley Authority. It has proved very difficult to address this very serious breach of non-proliferation norms – the use of commercial reactors to make weapons materials – and I believe that the environmental and health arguments have been more persuasive. So far, the production plans have not been put into effect and are being maintained only as a contingency.

(iii) Relaxation of Safe Drinking Water Standards: The process for licensing the proposed Yucca Mountain nuclear waste repository in Nevada has become the vehicle for a massive relaxation of Safe Drinking Water standards. Because it seemed unlikely even to the Department of Energy that the repository could meet the Safe Drinking Water Standards at the repository boundary, the DOE successfully put heavy pressure on the EPA to exclude under federal land around the proposed site from these standards, despite a great deal of hard work by many environmental groups. It wasn’t enough because burying nuclear power plant spent fuel and vitrified plutonium is seen as a goal that is desirable from a non-proliferation perspective. If the exclusion remains in place (it is under litigation both by environmental groups an industry, which thinks that Safe Drinking Water Standards should not apply at all), it will set a precedent that could harm water supplies throughout the country. This would be especially harmful in the West where water is scarce and a lot of land is federally owned. Both military and commercial radioactive waste would be disposed of at Yucca Mountain, should it be licensed. The repository threatens the only local source of water in the region, currently used for irrigation only twenty miles away from the proposed site.

Environmental work has been crucial to progress on nuclear disarmament. In one of the least remarked victories, work on health, environmental and safety issues led to the closure of most of the large nuclear weapons plants in the United States, such as plutonium and tritium production reactors in South Carolina and a large-scale plutonium pit manufacturing facility in Colorado, as the Cold War was winding down.

There were no treaties requiring their closure. But they will not be reopened. Of course, the job is not done because some nuclear weapons plants remain open in the United States and in other countries and new ones have been proposed.

B. Plutonium processing and catastrophic accidents:

Plutonium processing creates liquid high level radioactive wastes stored in tanks. These tanks can explode under certain conditions. A 1957 explosion of such a tank in the Soviet Union at the Mayak site in the southern Urals contaminated about 6,000 square miles, and 30 towns and villages were permanently leveled. There was a near miss in 1980 in France. Two such plants are being operated at the Savannah River Site, where more than 30 million gallons of high-level waste are stored. There are 177 high-level waste tanks at Hanford Washington, near the Columbia River. Many of the tanks at Hanford and Savannah River Site are at some risk of fires due to build up hydrogen and/or other flammable chemicals.

Commercial plutonium reprocessing produces the same kind of highly radioactive waste as military plutonium reprocessing. It is being carried out in France Britain, Russia, Japan, and India. (The only U.S. commercial reprocessing plant was shut in 1972.) The French and British plants have contaminated marine life as far away as Norway. Several European governments have asked that these plants be shut – so far to no avail.

Commercial plutonium is uneconomical as a fuel, being five to 20 times more costly than uranium fuel. It can used to make nuclear weapons. The threat of loose nukes from diversion commercial plutonium is among the most serious proliferation problems in the world. There are 12,000 canisters of surplus plutonium stored in Russia alone (at the Mayak site). Just two of those canisters contain enough material to make a bomb.

Despite the fact that plutonium is uneconomical (there is no argument about this even within the nuclear establishment), the Russian nuclear ministry, Minatom, regards plutonium as a treasure. One day it will be economical, according to this reasoning. In the meantime? Well, it is a significant proliferation risk. Plutonium could also be used as a radiological terror weapon.

Much of this infrastructure of plutonium storage and production is vulnerable in varying degrees to terrorist attack or to diversion of materials from within. And global stocks of unused commercial plutonium have now grown to rival military stocks. They are now over 200 metric tons, or enough to make 30,000 nuclear bombs. Measurement and accounting errors in commercial as well as military plutonium production systems have often exceeded the amounts needed to make nuclear weapons.

It is noteworthy that the main opposition to commercial plutonium in Europe-France and Britain are the centers of the industry – comes from other European governments on environmental grounds. Sea life as far away as Norway has become contaminated due to the radioactivity discharges. Increases in childhood and juvenile cancer have been detected at both sites, though typically the nuclear establishments dismiss the findings, as though they knew with complete confidence they were not response. They are more used to saying mea culpa after a few decades.

The main local public opposition to commercial reprocessing has also been around environmental as well

as economic issues. The security arguments have not taken hold, because governments have been too confident that they can actually control every contingency and that there will not be diversion. Perhaps that will change. But the security gains would be immense, were the environmental and economic arguments to succeed.

Some notes on process

Chris Wing suggested that I make some remarks on the process by which our work is done. None of the problems that I have discussed above can be solved solely within one country. Most of them affect the whole world. So we not only work with groups all over the United States, we work in the main countries where nuclear problems are severe. We rely on a few key advisors in each country where we do a lot of work to guide us. When we made the decision to work internationally some years ago, we also decided to publish in at least one of the principal languages of those countries. So the Institute for Energy and Environmental Research (IEER) publishes its newsletter in English, Russian, French, Chinese, and occasionally in other languages. Our web site is also multilingual – currently in English, French, Russian, and to a limited extent in Chinese, and Japanese. We hope to add Spanish this year, in a small way, and perhaps Arabic next year. Our staff also has exceptionally wide language capabilities, besides having strong scientific and communications abilities. We note only share our knowledge with groups in other countries, but benefit equally from their expertise. Our international work has led us to develop international media outreach and, to a lesser extent, outreach to policy-makers abroad.

In the process of our international work, we found one of the world's foremost experts on the proposed Yucca Mountain repository site in Novosibirsk, Russia. We began to work closely with one of the founding members of the Green Party in France, who is the leading activist against the plutonium separation plant in France, the largest in the world. There is a Gandhian center in western India, run by a physicist-physician couple, who have done what is, in my opinion, the best single health survey near a nuclear power plant. And all of these colleagues have come to the United States, as part of our program, to share their work and expertise with activists, researchers, and journalists here, even as we have shared ours with them.

Every year we hold a five-day technical training workshop for U.S. community leaders and activists as part of our goal of democratizing science. The participants get to know each other quite well in the process of rather intense technical sessions because they work together to prepare their own projects and presentations, which are invariably the best part of every workshop, whether it's on water resources or de-alerting nuclear weapons. The presentations range from the purely technical, to poetry to plays written during the workshop. We had our first techno-musical dramatic presentation this year, exploring the ideas of Einstein and nuclear energy.

We have become close to many of the people that we work with here and all over the world. Let me illustrate with a personal anecdote. Two of our friends are working to shut down the commercial plutonium reprocessing plant located in the beautiful Lake District in northwestern England where Wordsworth wrote his poetry and Beatrix Potter dreamed up Peter Rabbit. On their farm, they have a pair of pair of geese, an old couple, whom they have named after my wife (a fellow scientist at IEER) and me. The personal richness that comes out of the process is central to what sustains my colleagues and me in our work on what is, after all, a grim subject. Because of that I often think that process is our most important product.