Nuclear energy? Our future depends on our choices
Background paper to Maryknoll statement
March 2012

Introduction

Increased global warming threatens the survival of all living species in the biosphere. In response to this phenomenon, some are promoting an increase in the use of nuclear energy, claiming that it is "clean and carbon-free." Others insist that the burden of radioactive waste and the dangers of catastrophic accidents and terrorist attacks far outweigh the benefit of using nuclear energy to mitigate global warming.

Following the Fukushima Daiichi accident in March 2011, United Nations Secretary General Ban Ki-moon said that "accidents raise popular fears and disturbing questions … As we are painfully learning once again, nuclear accidents respect no borders. They pose direct threats to human health and the environment. They cause economic disruptions, affecting everything from agricultural production to trade and global services. This is the moment for deep reflection: how do we ensure both the peaceful uses of nuclear energy and maximum safety? We need a global rethink on this fundamental question." For us, the rethink is not about building robust power plants but about avoiding the harm from the so called "peaceful" uses of nuclear power.

On December 8, 1953, President Eisenhower addressed the UN General Assembly about the need to convert the image of nuclear power from a destructive and potentially apocalyptic force into one that is constructive and beneficial. "It is not enough to take this weapon out of the hands of the soldiers. It must be put into the hands of those who will know how to strip its military casing and adapt it to the arts of peace." While it may have been possible to convert spears, swords and other instruments of war into ploughs, pruning hooks and sickles, it is not possible to convert nuclear weapons into energy without generating high level radioactive waste that endangers life and increasing the threat of nuclear or "dirty" weapons proliferation.

Nuclear disasters at Windscale (1957), Three Mile Island (1979), Chernobyl (1986), and the one in March at Fukushima Daiichi demonstrate that nuclear energy is not clean, inexpensive or safe. Furthermore, the production of nuclear energy, which entails milling, enrichment and fuel processing, consumes fossil fuels in operating machinery and transport vehicles and leaves behind significant amounts of radioactive waste. The problem begins right at the mines where radioactive debris is left at the surface.

Other accidents are possible: A report by the Nuclear Regulatory Commission indicated that the Indian Point nuclear power plant, located less than 10 miles from Maryknoll, NY, has the highest risk of any U.S. plant for core damage from an earthquake; the Atomic Safety and Licensing Board has issued a decision that Indian Point cannot be relicensed without completing legally-required analyses of its severe accident mitigation measures.

Due to its close proximity to the Indian Point plant, Maryknoll is worried about the safety and health of its entire community; the tragic Fukushima Daiichi incident reminds us to examine more closely the adverse global effects of nuclear energy production. From our mission perspective of promoting peace, social justice and the integrity of creation, we believe that nuclear energy inflicts risks and burdens upon present and future generations. In this paper we examine how exposure to radiation endangers the environment and public health, and we review the problems that begin with uranium mining, the front end of the nuclear energy cycle, and end with the problem of "spent fuel" disposal, the back end of the nuclear fuel cycle.

Uranium mining

The problem begins right at the uranium mines. Surface and underground uranium mining cause significant geologic alterations of the earth leaving it unsuitable for agricultural use. The technique of uranium leaching involves the injection of hundreds of tons of sulfuric acid, nitric acid, and ammonia into the earth's strata and then pumping up the mixture. This method does not significantly harm the earth, but "*in situ* leaching causes large scale contamination of aquifers; not only by the added chemicals, but also by releasing radioactive and toxic elements such as radium, heavy metals and arsenicum." (Jan Willem Storm van Leewen and Phillip Smith) Due to lack of proper ventilation in underground mines, exposure to high concentrations of radon 220, a radioactive gas that causes cancer of the lungs, has affected one fifth to one half of the uranium miners in North America, many of them Native Americans. Some of them have died of lung cancer while others have been debilitated by lung disease. Another element present in uranium mines – radium 226 – is a lethal element that causes bone cancer.

Winds carry radioactive dust that contaminates agricultural land and aquifers. "Blighted Homeland," a multimedia series by the *Los Angeles Times*, documents how uranium mining has affected the health of the Navajos. "From 1944 to 1986, 3.9 million tons of uranium ore were extracted from Navajo homeland. Navajos inhaled radioactive dust, drank contaminated water and built homes using sand and rock from the mines and mills." As a result, some people developed cancer, some died, and a series of obstacles have prevented the cleanup of abandoned radioactive debris left near or around different mine sites.

Maryknoll Sister Rosemary Cecchini tells of the plight of communities at Crowpoint, New Mexico, and Tuba City, Arizona:

> I learned about continuing, adverse health and environmental impacts from past decades of uranium mining and abandoned mine sites, never cleaned up by responsible federal agencies and mining companies. Navajo miners working in open pit and underground mines were never warned of health risks from radioactive exposure to the uranium ore. Protective clothing, masks or essential ventilation were never provided by mining company officials, who were well aware of the radiation exposure to workers. Navajo miners, with uranium dust covered clothing, daily returned to their homes and families on the reservation. With no running water in homes, the women washed all the family clothing together using precious water hauled from wells 30 or 40 miles away. In

this way, other members of the family were also exposed to radiation from uranium dust. Privately funded health studies continue to identify and document diverse types of cancers, respiratory and kidney diseases, as well as diabetes related to past radioactive exposure to uranium in the mines and currently abandoned mine sites …

Uranium milling

Cancer has affected uranium miners, transporters and their families but uranium millers are also at risk from the effects of radiation. Mined uranium is transported to the mills in vehicles that consume fossil fuels which add more carbon dioxide to the environment. At the mills, the ore is crushed, screened and then washed. Acid or alkali baths leach the uranium from the ore producing a mixture which when dried yields a bright yellow powder called "yellowcake." Sandy waste in the form of radioactive tailings is left in piles near the mines. Until the early 1970s "mill tailings were left at sites in unstable and unprotected conditions. Little was known of its hazards to public health. The biggest site is in Northeast Church Rock where there is an abandoned mine and mill." ("Return of the Navajo Boy") The mill tailings contain radium and thorium, a dangerous radioactive element with a half-life of 80,000 years. Children who play in the dirt could later develop leukemia.

According to Dr. Helen Caldicott, "in the mid-1960s, local contractors at Grand Junction in Colorado discovered acres of discarded mill tailings, unguarded and untreated. Not knowing [that] they were radioactive, the contractors used them for cheap landfill and in concrete mix. Schools, hospitals, private homes, roads, an airport, and a shopping mall were constructed using this material. In 1970, local pediatricians noticed increased incidence of cleft lip, cleft palate, and other congenital anomalies among babies born to parents who lived in homes built out of radioactive materials that continually emitted gamma radiation and radon gas." Leaving behind radioactive waste, the companies transport the "yellow cake" to the enrichment plant. Again, transportation vehicles utilized for this purpose are powered by fossil fuel energy.

Uranium enrichment

Enrichment plant construction requires cement, brick, iron and steel, besides other materials, all from industries presently dependent upon fossil fuels. Energy is also needed in the uranium enrichment process itself. The uranium is first converted to uranium hexafluoride gas, a form that facilitates the separation of the fissionable uranium 235 from the non-fissionable uranium 238. Uranium ore contains only 0.7 percent of the fissile isotope U235. In order to be suitable for use as a nuclear fuel that generates electricity, it must be processed to a concentration of about three percent of U235 (low enriched uranium). Using the same equipment, weapons grade uranium has to be enriched to 90 percent of U235 highly enriched uranium). The remaining uranium 238 is known as "depleted uranium."

Depleted uranium

Uranium 238 is essentially what is left over after uranium enrichment. This uranium is depleted of the uranium 235 isotope but not of radioactivity. It is used in commercial products such as radiation shielding in medical equipment, aircraft counterweights, rotors, flywheels, ship ballasts, and gyroscopes. For military purposes it is used to make tank armor-piercing projectiles, the DU penetrator, which has been used in both Gulf wars and in Kosovo. Depleted uranium enters the body through wounds, inhalation of airborne particles, or ingestion of residue. (National Academies of Sciences, 2008)

According to Caldicott: "Depleted uranium is lying around in thousands of leaking, disintegrating barrels at the enrichment facilities in Paducah, Kentucky; Oak Ridge, Tennessee; and Portsmouth, Ohio; as well as in other places. During the 1991 Gulf war invasion, the United States used 360 tons of depleted uranium in the form of antitank shell in Iraq, Kuwait, and Saudi Arabia … Much of the depleted uranium is in cities such as Baghdad, where half the population of five million people are children who play in the burned-out tanks and on the sandy, dusty ground. Children are 10 to 20 times more susceptible to the carcinogenic effects of radiation than adults. My pediatric colleagues in Basra, where this ordnance was used in 1991, report a sevenfold increase in childhood cancer and a sevenfold increase in gross congenital abnormalities."

Nuclear fuel processing

After enrichment, uranium hexafluoride is converted to a ceramic solid, uranium-dioxide tablets that are then packed in Zircalloy tubes also called "fuel pins." The fuel pins are then bundled to form fuel elements. Nuclear power reactors are mostly fueled with low enriched and natural uranium. In the process, some of the uranium fissions (splits) producing energy in the form of heat. The steam produced in the process drives the turbines that generate electricity. Another portion of the uranium transforms into plutonium, some of which also fissions.

Plutonium-239 is a byproduct of the chain reaction in nuclear reactors. According to Amory Lovins, the British representative of Friends of the Earth, the irradiation of uranium fuel in any reactor produces plutonium, which is bomb material regardless of its composition or chemical form. Plutonium is a proliferation risk because it can be made into bombs so quickly that even instant detection cannot provide timely warning. Under the guise of "civilian power," reactors could produce large amounts of plutonium that can be used to make bombs. The nuclear fuel rods supposedly last up to 18 months, after which the concentration of chain-reacting isotopes drops to the point where the fuel is considered "spent" and has to be replaced with fresh fuel (Feiveson et al 2011).

Spent nuclear fuel

The spent nuclear fuel (SNF) is then removed from the reactor. This nuclear waste is highly radioactive because the unstable atoms lose energy by emitting ionizing particles (ionizing radiation). The process is also called radioactive decay. After about 18 months, the spent fuel rods are transferred to a storage facility. Because the spent fuel rods continue to emit radiation in the form of heat, they must be deposited in pools of water for about 10 years. Water acts as a coolant and a shield. After this period of time, the radioactive nuclear waste must be transferred to a repository where it must be isolated from humans, ideally in underground repositories.

In the United States, Nevada's Yucca Mountain had been designated as the site for the construction of a nuclear waste repository. However, the project was strongly resisted by Nevada residents; Rep. Dean Heller (now senator), in a stance at odds with his fellow Republicans, opposed the use of Yucca Mountain as a waste storage area, and wrote in a letter to Speaker of the House John Boehner and other Congressional leaders: "It is my hope that we can work together to address an energy policy that finds a solution to our nation's nuclear waste problem without jeopardizing the safety of the people of Nevada." Funding for the project was terminated in April 2011.

If the millions of dollars previously spent on this project had been invested in renewable resources such as solar, wind, geothermal and biomass, the country would have advanced in increasing energy supplies while reducing environmental pollution.

A project similar to the now abandoned Yucca Mountain site is being developed in Finland. This project has inspired "Into Eternity," a documentary that asks tough questions about the implications of nuclear energy and the haunting effects of radioactive waste. The nuclear waste repository, Onkalo (meaning hiding-place), is supposed to last 100,000 years but a warning is given to future generations who, for their safety, must avoid entering the place: "You are now at a place where we have buried something from you to protect you. We also need you to know that this place should not be disturbed, and we want you to know that this is not a place for you to live in. You should stay away from this place and then you will be safe."

The hazards related to radioactive waste are more serious than those from other kinds of waste. Humans could inadvertently intrude into a nuclear waste repository during mining or anthropological excavations. Since no trace of doubt can be allowed to exist regarding safety, how can human intrusion be prevented? What if terrorists access the repository in order to purposely retrieve radioactive material to make bombs and nuclear weapons?

Nuclear weapons proliferation

An inalienable link exists between nuclear energy production and nuclear weapons proliferation. The same process that produces civilian nuclear energy can be diverted to the production of nuclear weapons. We have seen that the enrichment of uranium 235 to 90

percent yields weapons material. In the same manner, 50 percent enriched uranium can also produce weapons material. This is why Iran's plan to enrich uranium has created tensions with other nations, and in a special way with the United States. According to Arjun Makhijani, president of the Institute for Energy and Environmental Research, "Iran claims it is pursuing commercial nuclear power; the United States believes it is acquiring nuclear weapons capability…" As a sovereign nation, Iran claims the right to enrich uranium for civilian purposes as affirmed in the Nuclear Non Proliferation Treaty (NPT), which allows signatories the peaceful use of nuclear technology.

The risks associated with the proliferation of nuclear fuel cycle technology are not exclusive to the Iran situation, but represent a global problem. Nuclear power provides a hidden infrastructure that could be used to fabricate nuclear weapons.

In 1946, Robert Oppenheimer, then chairman of the General Advisory Committee of the Atomic Commission, entertained the possibility of craftily converting the technology to nuclear arms manufacturing in case the Convention on International Control of Nuclear Weapons should require nuclear disarmament. He said, "We know very well what we would do if we signed such a convention: we would not make atomic weapons, at least not to start with, but we would build enormous plants, and we would call them power plants; maybe they would produce power. We would design these plants in such a way that they could be converted with the maximum ease and the minimum time delay to the production of atomic weapons … [W]e would stockpile uranium; we would keep as many of our developments as secret as possible…"

The lack of trust that has put nations at loggerheads is a challenge to converting nuclear technology into a wide-spread means of energy production. The purpose of the NPT was to work towards disarmament and to make sure that peaceful use of nuclear energy was not diverted towards arms proliferation. Why has total nuclear disarmament not succeeded yet? Countries with nuclear weapons continue to hold on to their arsenals. The Iran situation is an example of the tension and distrust that exists if those countries with nuclear weapons forbid countries without nuclear arms from acquiring them. If the latter countries have access to nuclear technology, there will be little control over their clandestine uranium enrichment for weapons production purposes.

We have seen that the enrichment of uranium 235, a vital component of reactor fuel, produces weapons material and the byproduct, plutonium, a material found in spent fuel, can also be used to produce nuclear weapons. The fission bomb that exploded over Hiroshima consisted of enriched uranium 235 and the one that exploded over Nagasaki consisted of plutonium 239. These bombs had immediate as well as long term effects on the environment as well as on human health. The atomic bombs' sudden, intense dramatic effects have left indelible memories of death, destruction and horror among the Japanese and peoples of the world. People in the affected areas still suffer from the effects of fallout.

In 1962, Rachel Carson wrote in her book, *Silent Spring*: "Strontium 90, released through nuclear explosion into the air, comes to earth in rain or drifts down as fallout, lodges in soil,

enters into the grass, corn or wheat grown there, and in time takes up its abode in the bones of human beings, there to remain until his [sic] death. It accumulates in the tissues of plants and animals and even penetrates the germ cells to shatter or alter the very material of heredity upon which the shape of the future depends. Radiation causes gene mutations."

Nuclear fall-out continues to haunt the peoples of Hiroshima and Nagasaki as they face recent effects from the Fukushima Daiichi nuclear plant accident. This event has awakened the world to the problems of nuclear waste disposal and the horrific consequences of nuclear accidents us and to future generations.

Inter and intra-generational justice

Although underground repositories are considered a solution to the problem of nuclear waste accumulation, various negative factors come into play and risks must be considered. Cesium-137 and strontium-90 are some of the "fission products" that account for most of the heat and penetrating radiation in high-level waste. Some uranium atoms also capture neutrons from neighboring splitting uranium atoms and thus transform into heavier elements. Plutonium is one of the heavier-than-uranium or "transuranic" elements that do not produce the amounts of heat or penetrating radiation that fission products do. However, they account for most of the radioactive hazards remaining in high level waste. **Plutonium 239 has a half-life of 24,000 years.** Other byproducts of the nuclear fuel cycle such as strontium-90 and cesium-137 have half-lives of about 30 years; meaning that half the radioactivity of a given quantity of the product will decay in 30 years. Radioactive isotopes will eventually decay or disintegrate to harmless materials but they continue to emit radiation during this process.

If plutonium takes such a long time to decay, there is no guarantee that construction materials will last that long before they undergo natural degradation. Also, new generations, cultures and languages evolve: how can future generations be warned about the buried nuclear waste? In case of geological shifts, how can the behavior of the buried nuclear waste be predicted? Can the buried nuclear waste be protected forever from human intrusion? Nuclear waste will outlive us since it is practically impossible to get rid of it. Native American leader Winona LaDuke has said, "They have created something that cannot be destroyed…."

The nuclear industry introduced a new kind of waste that is a danger to public health and to the environment. At the end of the documentary "Into Eternity," the issue of radioactive waste from the nuclear energy industry is raised, and the narrator's somber voice predicts the impending doom: "Once upon a time man learnt to master fire, something no other living creature had done before him. Man conquered the entire world. One day he found a new fire, a fire so powerful that it could never be extinguished … Then in horror he realized that his new fire could not only create but also destroy. Not only could it burn on land, but inside all living creatures, inside his children, the animals, all crops. Man looked around for help but found none. And so, he built a burial chamber, deep in the bowels of the earth, a hiding place for the fire to burn into eternity."

We need to assure the safety and security of future generations as well as to minimize the burdens they will endure. For the present generations, inequities between the beneficiaries of nuclear energy and those who have been affected by uranium mining, nuclear waste transport as well as the workers who were exposed to radiation, need to be amended. Uncertainties as to what will happen to the radioactive waste that will not go away after millennia should be truthfully addressed. The inventory of high level waste is increasing and time is running out.

Safety and security are basic issues that are presently being achieved through onsite storage of spent fuel rods. As the amount of waste increases, where will it be safely stored? Increased terrorist threats make surface storage a security risk. How can we assure safety for us and generations to come? Where will we hide the highly toxic waste?

The risks issuing forth from nuclear energy production outweigh the benefits of mitigating global warming. A serious reflection from the ethical point of view reveals that:

- The nuclear fuel cycle is a danger to public health and heavily pollutes the environment.
- The nuclear fuel cycle is unsafe because it contributes large amounts of radioactive waste for which the world has not yet found a safe repository.
- Workers, their families, most of them native peoples, are continuously exposed to radioactivity.
- The U.S. government (as well as other governments) heavily subsidizes the nuclear industry and by so doing, diverts funds that could promote development in the renewable energy sector.
- The goal of reducing carbon emissions to zero cannot be achieved through the use of nuclear energy because fossil fuels still play a major role in powering the nuclear fuel cycle.
- Nuclear power and nuclear weapons are so closely linked that it is impossible to separate the two.
- The nuclear fuel cycle, especially the enrichment stage, could be exploited by terrorist groups and unstable governments who will engage in the production of weapons of mass destruction or dirty bombs.

Conclusion

Nuclear energy is a quick but temporary solution to the problem of global warming. Our survival will depend upon our choosing energy from renewable resources. This will also guarantee the survival of future generations and an environment free of radioactive waste. The actions require us to change our lifestyle so as to reduce energy consumption. As individuals, we need to ask ourselves how efficiently we are using energy and to look for ways to cut back on consumption.

Our hope is that the citizens of the earth will be included in the dialogue as governments look for effective ways to combat global warming. Current storage of radioactive nuclear waste is inefficient and dangerous. Building more nuclear plants for the purpose of generating more nuclear energy without having found a solution to the accumulating radioactive waste is

irresponsible and unjust. The availability of uranium and plutonium which can be made into bombs threatens global and homeland security. All these issues convince us that nuclear energy is not the answer to global warming. This background paper has provided us with an overview of the nuclear fuel cycle and will serve to illuminate further reflection and concrete actions centered on nuclear energy as we strive to preserve the integrity of the earth for the sake of future generations.

We recall the words of Oglala Lakota Sioux leader John Hollow Horn: “Some day the earth will weep, she will beg for her life, she will cry with the tears of blood. You will make a choice, if you will help her or let her die, and when she dies, you too will die.”

From Thomas Berry we will remember that “the human community and the natural world will go into the future as a single sacred community or we will both perish in the desert.” (*The Dream of the Earth*, Sierra Club, 1988)

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Appendix 1

Letter from New York Attorney General to Nuclear Regulatory Commission, March 28, 2011, regarding seismic risk at Indian Point Nuclear Generating Station

Dear Chairman Jaczko and Commissioners Svinicki, Apostolakis, Magwood, and Ostendorff:

I am writing you as a nuclear crisis, initiated by the March 11 earthquake and subsequent tsunami in Northern Japan, is still unfolding. In addition to its potentially devastating impact on the people of Japan, this crisis serves as a graphic demonstration that nuclear power facilities in the U.S. may be vulnerable to seismic activity and experience catastrophic failures that compromise their ability to control and cool multiple nuclear reactors. Data from your staff analysis (GS-199), which demonstrates an increased risk of seismic activity at some nuclear power plants in the country add to my concern.

These factors underscore the importance of a fair, open, and full assessment of seismic risks in the relicensing of Indian Point.

New York State has raised concerns about seismic risk and other issues in relation to the relicensing of Indian Point with your staff on numerous occasions. At each turn, however, the NRC has refused to consider these critical issues in the relicensing review process.

As you know, the Indian Point nuclear power station in Buchanan, New York sits 24 miles from New York City. Of all the power reactors in the United States, the two operating Indian Point reactors have the highest surrounding population both within a 50-mile radius and a 10-mile radius. Seventeen million people live within 50 miles of these reactors. Indian Point Units 2 and 3, which initially came on line in 1973 and 1975, are currently the subject of an adjudicatory proceeding to extend their license by another 20 years (Unit 1 ceased generating in the 1970s). As the NRC has acknowledged, Indian Point Unit 1, which was authorized in 1956, was built prior to any specific requirement for earthquake protection. Although the NRC revoked the operating license for the Indian Point Unit 1 power reactor in 1980, many of Unit 1's system, structures, and components were conjoined to Unit 2 and Unit 3 and are still in use today. These aging Unit 1 systems, structures, and components were built to inferior seismic specifications, and Unit 2 and Unit 3's continued reliance on these systems today poses significant safety questions.

The NRC has consistently blocked consideration of New York's seismic concerns, as well as related concerns about population, emergency evacuation, fire safety, and site security. In November of 2007, the Attorneys General of New York, Connecticut, Delaware, Illinois, Kentucky, and Vermont submitted a letter to the NRC which expressed the states' serious concerns about the NRC's failure to confront issues such as local seismic activity when deciding whether to renew the operating license of a nuclear power plant beyond its initial forty-year term. The states requested that the NRC expand relicensing criteria to include seismic analysis. On December 30, 2007, the NRC rejected this request.

The NRC also disregarded New York's "scoping" comments in 2007, which noted that the Indian Point operator's Environmental Report and Updated Final Safety Analysis Reports do not reflect seismic information developed after the early 1980s, and which asked the NRC to require the owner to revise those outdated documents. The NRC subsequently issued a Draft Environmental Impact Statement (DSEIS) based on this out-of-date information. The DSEIS failed to mention new information regarding seismic activity developed recently by the United States Geological Survey (USGS) that included the area around Indian Point or to account for the findings of Columbia's Lamont-Doherty Earth Observatory 2008 study. In fact, the NRC has not revised any of its Indian Point-related environmental analyses to take into account findings from this important independent study.

Perhaps most egregious is the NRC Staff's issuance of the Final Supplemental Environmental Impact Statement (FSEIS) for Indian Point, which it issued three months after Staff issued the GS-199 analysis on seismic activity. The FSEIS did not make any reference to the NRC's own findings of increased seismic risk at Indian Point.

In November of 2007, the state submitted two contentions in the license renewal proceeding arguing that the applicant's "Updated" Safety Evaluation Report and Environmental Report insufficiently analyzed alternatives for mitigation of severe accidents like earthquakes in that it (1) failed to include recent information regarding the type, frequency, and severity of potential earthquakes and (2) failed to include an analysis of mitigation measures which could reduce the effects of an earthquake damaging the parts of inactive Indian Point Unit 1 which are currently in use at Units 2 and 3. The NRC Staff opposed acceptance of these contentions, and the Atomic Safety and Licensing Board excluded them from consideration in the adjudicatory proceeding because, it said, the state did not suggest feasible alternatives to address risks posed by the new data, or estimate the cost of the increased margin of safety that would result from any severe accident mitigation action. This burden is clearly not the public's to bear and these contentions were excluded in error.

Earlier this week, in testimony before the Senate Committee on Environment and Public Works, Chairman Jaczko stated the NRC's intention to conduct a review of the earthquake-related risks faced by nuclear power facilities operating in the central and eastern U.S. He stated that this review would take one to two years to complete, followed by a similar period of time to consider and implement mitigation measures. Indian Point Units 2 and 3 are currently the subject of a proceeding to extend their licenses by another 20 years – a proceeding in which the NRC has consistently ignored serious consideration of the risks that earthquakes and related issues pose to the Indian Point facility.

NRC should not contemplate relicensing Indian Point without first completing an open and public review of earthquake-related risks faced by this facility.

For this reason, the NRC must undertake an immediate, full, fair, and open assessment of all public health and safety risks that earthquakes pose to this facility, and provide the public an opportunity to fully review and comment on all phases of this review.

In addition, the NRC must take the following actions:

- Promulgate an amendment to Part 54 and any other relevant regulations, which exclude seismicity analysis from the scope of safety review in relicensing proceedings, to specifically require the preparation of a public site-specific seismic analysis for the Indian Point and other reactors;
- Open up the GS-199 seismic analysis proceeding for meaningful participation by states and the public so that all assumptions can be identified and tested and ensure that all information used in this proceeding is made available in the public record;
- Address the risk posed by the Indian Point Unit 1 facilities, which share many common components and systems with the other Indian Point units, in a complete and transparent way;
- Incorporate USGS findings and Columbia Lamont-Doherty's findings into the Indian Point FSEIS for license renewal and re-issue the document for additional public review and comment;
- Make public immediately the Commission's plans, in their entirety, for addressing seismic risk at all three Indian Point plants; and
- Maximize public involvement in the Commission's and the NRC Staff's actions regarding seismic risk at Indian Point.

Whether or not one supports the re-licensing of Indian Point Units 2 and 3, we can all agree that we must protect the health, safety, and environment of the nearly 20 million people living in close proximity to the facility. Only through a full, fair, and open assessment of the earthquake and related security risks surrounding this uniquely-situated plant – one that precedes any consideration of approving an extension of the Indian Point facility for another 20 years – can we provide these fundamental protections.

I thank you for your attention this request, and please do not hesitate to contact me at any time if I can provide additional information or you would like discuss this matter in greater detail.

Sincerely,

Eric T. Schneiderman
Attorney General

Appendix 2

Editor's note: This letter, written by a Vietnamese immigrant working as a police officer in Fukishima to a friend in Vietnam, has been circulating on Facebook among the Vietnamese diaspora. It is an extraordinary testimony to the strength and dignity of the Japanese spirit, and an interesting slice of life near the epicenter of Japan's current crisis, the Fukushima nuclear power plant. It was translated by New America Media editor Andrew Lam.

Brother,

How are you and your family? These last few days, everything was in chaos. When I close my eyes, I see dead bodies. When I open my eyes, I also see dead bodies. Each one of us must work 20 hours a day, yet I wish there were 48 hours in the day, so that we could continue helping and rescuing folks.

We are without water and electricity, and food rations are near zero. We barely manage to move refugees before there are new orders to move them elsewhere.

I am currently in Fukushima, about 25 kilometers away from the nuclear power plant. I have so much to tell you that if I could write it all down, it would surely turn into a novel about human relationships and behaviors during times of crisis.

The other day I ran into a Vietnamese-American. His name is Toan. He is an engineer working at the Fukushima 1 nuclear plant, and he was wounded right at the beginning, when the earthquake struck. With the chaos that ensued, no one helped him communicate with his family. When I ran into him I contacted the U.S. embassy, and I have to admit that I admire the Americans' swift action: They sent a helicopter immediately to the hospital and took him to their military base.

But the foreign students from Vietnam are not so lucky. I still haven't received news of them. If there were exact names and addresses of where they work and so on, it would be easier to discover their fate. In Japan, the police do not keep accurate residential information the way they do in Vietnam, and privacy law here makes it even more difficult to find.

I met a Japanese woman who was working with seven Vietnamese women, all here as foreign students. Their work place is only three kilometers from the ocean and she said that they don't really understand Japanese. When she fled, the students followed her, but when she checked back they were gone. Now she doesn't know if they managed to survive. She remembers one woman's name: Nguyen thi Huyen (or Hien).

No representatives from the Vietnamese embassy have shown up, even though on the Vietnamese Internet news sites they claim to be very concerned about Vietnamese citizens in Japan - all of it a lie.

Even we policemen are going hungry and thirsty, so can you imagine what those Vietnamese foreign students are going through? The worst things here right now are the cold, the hunger and thirst, the lack of water and electricity.

People here remain calm - their sense of dignity and proper behavior are very good - so things aren't as bad as they could be. But given another week, I can't guarantee that things won't get to a point where we can no longer provide proper protection and order. They are humans after all, and when hunger and thirst override dignity, well, they will do whatever they

have to do. The government is trying to provide air supply, bringing in food and medicine, but it's like dropping a little salt into the ocean.

Brother, there are so many stories I want to tell you - so many, that I don't know how to write them all. But there was a really moving incident. It involves a little Japanese boy who taught an adult like me a lesson on how to behave like a human being:

Last night, I was sent to a little grammar school to help a charity organization distribute food to the refugees. It was a long line that snaked this way and that and I saw a little boy around nine years old. He was wearing a t-shirt and a pair of shorts.

It was getting very cold and the boy was at the very end of the line. I was worried that by the time his turn came there wouldn't be any food left. So I spoke to him.

He said he was in the middle of PE at school when the earthquake happened. His father worked nearby and was driving to the school. The boy was on the third floor balcony when he saw the tsunami sweep his father's car away. I asked him about his mother. He said his house is right by the beach and that his mother and little sister probably didn't make it. He turned his head and wiped his tears when I asked about his relatives.

The boy was shivering so I took off my police jacket and put it on him. That's when my bag of food ration fell out. I picked it up and gave it to him. "When it comes to your turn, they might run out of food. So here's my portion. I already ate. Why don't you eat it?"

The boy took my food and bowed. I thought he would eat it right away, but he didn't. He took the bag of food, went up to where the line ended and put it where all the food was waiting to be distributed. I was shocked. I asked him why he didn't eat it and instead added it to the food pile …

He answered: "Because I see a lot more people hungrier than I am. If I put it there, then they will distribute the food equally."

When I heard that I turned away so that people wouldn't see me cry. It was so moving -- a powerful lesson on sacrifice and giving. Who knew a 9-year-old in third grade could teach me a lesson on how to be a human being at a time of such great suffering? A society that can produce a 9- year-old who understands the concept of sacrifice for the greater good must be a great society, a great people.

It reminds me of a phrase that I once learned in school, a capitalist theory from the old man, Fuwa [Tetsuzo], chairman of the Japanese Communist Party: "If Marx comes back to life, he will have to add a phrase to his book, Capital, and that 'Communist ideology is only successful in Japan.'"

Well, a few lines to send you and your family my warm wishes. The hours of my shift have begun again.

Ha Minh Thanh