

"RSA JFN: Nuclear waste: messages not being conveyed and things not been considered" Abstract

November 21, 2017

<Mr. Hiroako Koide>

Ever since nuclear power plants began to work in Japan, 57 plants have been in operation since 1966. The cumulative power generation amount is 7.5 trillion kWh. Fission products (ashes of death, nuclear waste), which were yielded by the power generation, reached about 125,000 Hiroshima Nuclear Atomic Bombs and even if the attenuation of Cesium 137 is included, 900 thousand remained. Japanese people do not know this fact.

Then, what can we do about this? We want to abandon the wastes, however, what should we do?

Alchemy, which was popular in the medieval era, is the foundation of modern chemistry, but we found that the elements can't be changed after all, which put alchemy in decline. On the other hand, we now know that nuclear fission products can be produced from uranium 235 and plutonium 239 used in Nagasaki Atomic Bomb can be produced by applying neutrons to uranium 238. Therefore modern science knows that alchemy works. Since the United States launched the world's first nuclear reactor in 1942, we have been researching on the extinction and transmutation processing using this modern alchemy. We believed that we would be able to decontaminate someday by advancement of technology. After all, the research lasted for 75 years has not been successful yet. It is not hard to say that the endeavors are quite challenging.

Space disposal, ocean floor disposal, ice sheet disposal, etc. have been considered to isolate nuclear waste from the human living area, but each has technological and social difficulties, leaving the geological disposal to be the best solution. Japanese law also adopts geological disposal, but we must ensure safety over 100,000 years. However, is it possible for electric companies just running business for 60 years to take responsibility for keeping wastes for tens of thousands of years? Is it the government's responsibility? Is it possible to bear responsibility to Japan that has only existed for about 2,700 years for such a long period of time?

Japanese government decided to adopt Nuclear power generation and advanced with the power company, nuclear power industry, general contractors, subcontracted small and medium enterprises, police, court, mass communication, labor union, etc. However, even when the fast breeder reactor

"Monju" developed with more than 1 trillion yen failed, no one was accused of its responsibility. Now the nuclear powers promotion group plans to develop a next generation breeder reactor only after learning that they don't have to take any responsibility. Rokkasho village reprocessing plant has been invested 2 trillion yen, but it will go bust without no one meeting the obligation.

Fukushima nuclear power plant is still under abnormal condition where nuclear emergency declaration continues for more than 6 year. It will not be released even after 100 years. Even these things are not informed to the public and no one is asked to hold consequences.

Japan is a country where once you make a plan and fail, no one is charged of responsibility. However, in Germany, for example, people learned the responsibility of the previous war from history. Here is a quote from Weizsäcker "we are not able to change the past or not to make it not happen later in our history. However, if we close our eyes to our past, we will eventually be blind at the current moment" Similarly, I believe that issues on Japan's nuclear power and nuclear waste can only be overcome while revealing responsibilities looking into our history.

<Mr. Azby Brown>

Government-led public projects are usually top down, but the Aarhus Convention defines citizens' right to participate in decision-making in environmental affairs. I first learned about this treaty from Dr. Gaston Meskens, who researches the ethical aspects of nuclear energy in Belgium. In 1998, the EU and other 46 countries joined this convention ensuring the rights for citizens to be informed about and to be involved in decisions about their environment. It consists of three principles. The first is the transparency of information. Everyone must have access to information, which is something that SAFECAT also puts importance on. The second is to the right to participation. The Aarhus Convention recognizes citizens' right to say "no." To some degree there is often consultation with citizens about where to put facilities like fossil fuel power plants, etc., and communities are often able to oppose having them in their neighborhood, but usually this is after the decision to build the power plant has already been made in top-down fashion. The third is access to justice. If either of the first two rights are not upheld, citizens have the right to go to court. Governance based on disclosure becomes the most important fundamental principle.

However, the Aarhus Treaty still has many loopholes. One of the problems is that because this treaty is multilateral, involving many countries, the standards of transparency are different from country to

country. There may be differences in the allowable levels of radiation release, for instance, and exceptions are made for information related to national defense and intellectual property rights. In addition, Aarhus assumes that the wishes of citizens will usually be represented by NGOs, rather than stipulating a process for direct citizen involvement. Moreover, it is procedural, rather than establishing standards and outcomes. It does not try to establish what is “safe,” but sets guidelines for reaching consensus that involves citizens. Until now, in most cases in most countries, there has been little debate about citizen participation in decisions about adopting nuclear power plants as policy, but since Aarhus there have been a few notable examples in Europe of citizens being well-consulted in decisions about where to put nuclear waste repositories. The crucial point is that there is still no real citizen involvement in discussions at the initial stages of setting energy policy.

This is about what Meskens calls “the right to be responsible.” Citizens have not really taken responsibility for these kinds of decisions, thoroughly considering paying the consequences themselves when failures may occur. We have avoided doing so and have not taken any action, which allows us to put the blame elsewhere. So, what should we do from here? SAFecast believes that citizens can and should expect and demand disclosure and transparency as a matter of course, and once these expectations become the norm, the establishment of citizen participation systems may make new solutions possible. I think building a foundation for establishing new relationships among government, energy companies, and citizens is the key.

<Mr. Pieter Franken>

Regarding the problem of nuclear waste, there are guidelines established by the Aarhus Conventions and others, but in reality, I think that they are not effectively functioning well.

Six years ago, when the Great East Japan Earthquake occurred, I took this critically since my wife was from Ishimaki, and started the activities of SAFecast in order to protect my family. In Fukushima, we started collecting radiation data using a Geiger counter equipped with state-of-the-art technology. What I thought then was that if there is no action, nothing happens, and we will just be discussing on and on. We collected data across Japan from Fukushima as the starting point. Data is measured in places where volunteers consider their needs and want to know. As a result, we now have a world map covering 80 million locations of data on radiation.

Now, let me introduce SAFecast from seven perspectives: 1. Pro Data: We discuss issues based on data

~~beyond~~ avoiding factions such anti-nuclear and pro-nuclear 2. Always Open: We provide data that respects the right to know 3. Deploy or Die: We were quick in action because we saw that innovation requires making errors. 4. DIY: we take a do it yourself attitude (I will not rely on anybody. I make instruments by myself. I will measure the places I want to measure) 5. Pull over Push: This is the opposite of "top-down," and we encourage people to guide their activity themselves; 6. Anti-Disciplinary: Our volunteers play many different roles and avoid over-specialization 7. Community Centric.

We promote citizen science, providing independent data that can be analyzed by others, submitting our own research papers to peer-reviewed journals, and have gradually gained recognition among specialists and official bodies in the field.

<Q & A>

What is the status quo of the development of decontamination technology? Is it impossible to transform radiation?

Even when we spend a huge amount of money and time for more than 75 years, we have not been able to come up with the technology of decontaminating nuclear waste. In order to apply modern alchemy to decontamination, energy is necessary and if it is not enough to put all the energy made in the nuclear power, there is no meaning to originate nuclear power in the first place. Also, there is a side reaction that getting rid of the waste while generating new one. Technologies that could not be developed over 75 years will be difficult to realize in the future.

At any rate, radiation is a dangerous substance. The heavily polluted radioactive Cesium 137 that was released by the Fukushima nuclear power plant accident and designated both Tohoku and Kanto region as "radiation control area" only weighs 750 g. It is said that radiation can't be felt by the five senses, but if human beings did, they would die before they felt it.

What can we do with the existing nuclear waste in order to reduce the consumption-disposal inequality among generations?

The principle of managing nuclear waste is to keep it as compact as possible and manage with concentration. The Cesium 137 released into the air during the Fukushima Nuclear Power Accident is 168 times larger than the amount scattered by Hiroshima Nuclear Atomic Bomb, the Japanese government says. Most of it flowed toward the Pacific Ocean and only about 16% fell onto the Japanese

land. Among them, we have packed the soil of the surroundings of the house and the school grounds as "decontamination," but the amount has already exceeded 10 million bags of flexible containers. The Japanese government is planning to spread them all over the country, but I don't agree with this. Radioactivity exposed to residents including Cesium 137 was originally from the Fukushima Daiichi Nuclear Power Station. Since they are finally packed into flexible containers, they should be returned to the original Fukushima Daiichi Nuclear Power Station. However, Daiichi Nuclear Plant is still a battlefield where numerous workers are fighting in the nuclear reactors melt down. I think that we shouldn't return them there. Therefore, I think it would be better to collect the nuclear waste in the premises of Fukushima Daiichi Nuclear Power Station.

We should stop nuclear power to yield waste that we do not know how to handle. Nevertheless nuclear waste that has already been created is huge. The best thing we can do now is to store the waste in a dry cask and monitor the facilities instead of burying them in the basement before screwing things up and go beyond retrieval.

What do you think of Olkiluoto?

Although Finland did not depend heavily on nuclear power for power, it still uses four nuclear power plants. Therefore they are trying to fill up the spent fuel that have made in the basement of Olkiluoto and have a plan that enables them to retrieve wastes as an option if there is any inconvenience. Because the population of Finland is small, it was easier for them to decide to bury them in existing nuclear power plants through consensus of citizens based on the Aarhus Convention. Japan, the world's most earthquake-prone country has no stable rocks so it can't dispose nuclear waste underground.

What is your opinion on the scientific basis for the effects on the human body at low doses and the lack of scientific discussion on low doses for Fukushima products with excessive reaction?

We can't say that the risk of low dose radiation exposure is not "scientifically proved." If you say that it has not been proven in the science of epidemiology, certainly, it is not proved. For example, according to the Lifespan Survey of the US military Hiroshima Atomic Bomb, when compared to people who are not exposed to bomb with survivors, leukemia and cancer were more frequently found. As they continued the survey, they found that many cancers occurred even at points far from the hypocenter. Currently, we know that many people suffering from radiation exposed to radiation of 20 to 50 mSv also have cancer. However, if you want to see the results lower than such measure, you have to keep investigating even more as long as you use epidemiology. In that sense, there is a limit to prove with

epidemiology.

Nevertheless, we know that radiation exposure is dangerous, no matter how low the exposure dose. There is also a biophysical experimental research, however, it is scientifically recognized that it is dangerous even in a trace amount when we look at the exposure from the comprehensive scientific view. That is why the law regarding the use of radiation regulates that people should not be exposed to more than 1 mSv per year in Japan. However, the happening of the accident of the Fukushima nuclear power plant made Japan to announce a nuclear emergency declaration and decide administratively that the limit was raised up to 20 mSv per year.

Certainly, as the exposure dose decreases, the danger will also minimize. However, there is no zero risk. From here on, ethical problems are involved, but I think accountability is neglected because ethical rights are not fully protected in Japan.

For employees dealing with radiation, the Government and the IAEA have agreed that they should tolerate exposure up to 20 mSv per year in return for their salaries. However, it is not because it is safe. The limit of radiation exposure is to be determined by themselves, who would be exposed to radiation.

<Discussion>

What we can do while we are waiting for the advancement of decontamination technology and preserving waste on the ground that already exists? If we go beyond discussing, what action can we take? As to begin with, I would like to think about whether we have the right of taking "responsibilities."

It is impossible for humans to take responsibility for issues that last more than 100 years. I feel a dilemma. Also is there any meaning to it? Isn't it impossible to take responsibilities for a problem too gigantic? Even though human beings can take responsibility for their work for tomorrow, we can't take responsibility for things happening long time in the future. Moreover, assuming that the responsible person pays the consequences for the accident at Fukushima nuclear power plant, the problem is too large compared to the compensation causing unbalance, so we can't find a meaning in pursuing responsibility. Instead, I think it is now necessary to think about the responsibility of the influence and create new regulations, because it relates to things that may create new threats to human beings such as AI.

Nuclear power itself is a very difficult field when citizens try to make a case. Even if you read a book etc.,

each book gives different remarks making it impossible for an ordinary person to understand. I think that it will become clearer if there is a place for discussion by experts in nuclear energy promoters and antagonists. We could see where that person is coming from and understand the differences how the conclusions were drawn. This will clarify the problem of responsibility.

Japan is thought to be a transparent society, however, I find that there is no place to discuss in Japan.

I think that it is not only the responsibility of the company and the government but also the responsibility of the citizens who had made them unleashed. For example, I think that paying tax without complaining about having to pay a lot of taxes on Fukushima's problem is one way of taking responsibility.

If there is a problem, engage it as your own problem, for example, let's remember the summer of 2012 where electricity saving was possible. We all survived. This problem is an energy problem. You can also switch the power supply to sustainable energy. Sometimes it is possible for individuals to raise awareness on energy conservation.

When we look at the energy problem from bigger perspectives, we need to put the expansion plan of thermal power plant, CO2 issues, problems concerning environmental overload into consideration. We are over-using energy too much. The energy consumption of the Japanese people now is about 120,000 kilocalories per day per person. In order to fully live our lives, 50,000 kilocalories per day is sufficient, so I think our energy consumption should be reduced to less than half of now. We can take measures to de-energize even in transportation and invest in industries that do not use so much energy. We should consider building a social system that enables us to live with fulfillment without using large amounts of energy.

If we keep it as it is, Japanese nuclear power plants will last 50 years and waste will only accumulate.

Governments, companies, and media involved in nuclear power generation create a major market and the stakeholders can't break this relationship. There is a possibility for individuals to establish discussion forums led by NPOs and to convey facts to young people in particular.