

Nuclear energy: the Lessons from Fukushima

by INAMI Tetsuo
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Translation by Frauke Arndt-Kunimoto

Opening Comments

Ladies and gentlemen, as the only country which was a victim of a nuclear bomb that was dropped during wartime, Japan has the role of being in the very front line of the anti-nuclear movement. But now, a serious level 7 accident has happened which puts Japan in the position of being the aggressor towards the rest of the world.

The accident has been defined as being "unforeseeable", but since over history, big tsunamis have hit the area again and again, I believe it is a disaster caused by human beings, based on the false belief that nuclear power is a save technology.

The disaster talk force of my party has set up a Fukushima Prefecture temporary housing committee and a team for the program for government-paid housing. As the head of these groups, it has been my goal to move closer to the victims and to work towards moving people out of temporary housing. I have visited the affected areas frequently and would like to report to you based on these experiences.

(I believe there are going to be many questions and comments after my talk, so in order to make more efficient use of the time, we decided that the main part of my speech, for which the scrips was translated in advance, will be read in the translation only and I will add some things briefly at the end. That gives us more time for discussion.)

Intro

More than 7 months have passed since the Great Eastern Japan earthquake and tsunami. First of all, let me express my gratitude for the many helping hands that were extended to us from all over the world, starting immediately after the disaster.

As of October 4th, the number of human casualties consisted of 15 821 deaths and 3 931 persons missing. More than 298 000 houses have been completely or half destroyed. Even now, almost 170 000 people are forced to live an inconvenient life as evacuees in temporary housing or in private apartments that the government has rented. The affected region has a long history of big earthquakes and tsunamis. It was hit by earthquakes in 869, in 1611, in 1896, in 1933 and in 1960 (the Great Chilean earthquake). That such an area has suffered again, and that we as politicians did not implement better measures in order to prevent the consequences of the disaster from reaching such dimensions, fills me, as a politician, with heartbreaking grief.

At the Fukushima Daichi Nuclear Power Plant, the reactors 1, 2, 3, 5, and 6, which were in operation at the time, were brought to an emergency shutdown.

But 40 minutes after the earthquake, the tsunami came. It was 14 to 15 meters high, therefore higher than the premises which are 10 meters above sea level. The tsunami caused a complete blackout. The emergency power system, which runs with a diesel power generator, was damaged by the tsunami and the fuel tank was washed away by the tsunami. Therefore, it was not possible to pour water into the emergency core cooling system. At reactor No. 1 there was a hydrogen explosion on the 12th at 15:36. At reactor No. 3 there was a hydrogen explosion on the 14th at 11:01. At reactor No. 2, there was at the damage to the pressure suppression chamber on the 15th and 06:20. It is a large-scale accident, a major accident of level 7 on the INES scale. This was a shock to the world.

In the wake of the accident, the "myth of the safety of nuclear power" was disrupted in a single blow. During the long period of believing in that myth that nuclear power was safe, even the discussion of severe accident countermeasures, had been neglected or even completely omitted. This is now something to be profoundly regretted. From now on, it is being demanded of the government to cope with the situation after the accident and at the same time, to discuss how to make a profound change to the energy policy in the future.

The current situation of the Fukushima Daiichi Nuclear Power Plant

On April 22nd, several evacuation zones were established. The so-called "caution zone" of 20km around the plant is off limits, there is no trespassing. The zone between 20 and 30 km, became the "emergency evacuation preparation zone" as a precaution in case of another hydrogen explosion. Areas which are outside the 20km radius but have expected radiation levels of over 20milliSv per year, also became off limits as part of "planned evacuation zones". There are also areas for which evacuation is recommended due to high radiation levels in limited areas. These are designated as "specific evacuation recommendation spots". Currently, the temperature at the bottom of the pressure vessels in reactors 1,2 and 3 is stable at less than 100°C. The temperature of the fuel pools is around 30-40°C. Now that nitrogen was injected into the pressure vessel, and now that the water circulation cooling system is a stable operation, the first stage towards bringing things under control and to eventually achieve a cold shutdown has been announced as completed. Therefore, the 20-30km "emergency evacuation preparation zone" has been dissolved. The total Cesium (Cs-134 and Cs-137) which is being released from reactors 1-3 is reported to be about two hundred million Becquerel per hour. That is a four-millionth of the eight hundred tera Becquerel per hour of March 15th.

Problems in Fukushima Prefecture

Decontamination

On Aug 26, the nuclear disaster task force has put together a "basic policy for emergency decontamination". Areas with contamination levels of more than 20milliSv per year are going to be reduced quickly and step-by-step.

The long-term goal is that the contamination reaches 1milliSv per year and that over a period of two years, the contamination is cut in half. In order to restore an environment in which children can live free from anxiety, the goal is that contamination in schoolyards and parks should be cut down by 60% over the next two years. This equation includes a 40% decrease of contamination levels which is caused by natural causes, which means that the radioactive material is physically decomposing and washed away by the wind and rain (weathering effect). In the areas where the radiation is estimated to reach more than 20milliSv per year, the "caution zone" and the "planned evacuation zones", the government is going to carry out the decontamination. In other areas with radiation levels between 1 and 20milliSv per year, the local municipalities will carry out the decontamination according to the "decontamination guideline", using technology and funding provided by the government. For the people who were forced to evacuate from the "caution zone" and the "planned evacuation zones", the most pressing issue is when they will be able to return home. Decontamination both gives them hope and the energy to start with their lives over again.

However, on September 1st, based on a monitoring a widespread area at 1m level and 1cm level, the areas with the highest radiation level within the "caution zone" had a contamination of 139.0/368.0mikroSv/h . But in the "planned evacuation zones" the highest levels were 41.3/105.0mikroSv/h. This means that in order to reach the long-term goal, not only a lot of time is going to be needed, but that also a huge amount of work lies before us.

Shipment control of goods & Harmful rumors

The radioactive material which was released due to the hydrogen explosion has caused a widespread environmental contamination. Shipment control continues of some food items; for example raw milk, some vegetables, mushrooms, bamboo sprouts, plums, beef, tea, and some fish like Japanese trout, Yamame trout and juvenile sand eel. Some fruits, in which the monitoring did not result in the detection of radiation above the allowed levels, like cherries, peaches, nashi-pears and apples, experienced very slow sales due to harmful rumors. Contaminated rice straw which was used to feed cows was found as far away as the neighboring Miyagi prefecture (north of Fukushima). The contaminated beef which had been circulated had to be recovered. This kind of chaos is continuing. All businesses which were located within the 20km zone were forced to leave. More than 7100 businesses received a temporary permit to enter the zone to retrieve their machines or tools. They are forced to do their work at temporary work sites. As for tourist sites, the dramatic decrease of customers has led to a slump in business for hotels and inns.

Compensation

With the "Act on Compensation for Nuclear Disasters", there had been a insurance contract between the power company and the government of up to one hundred billion yen for one site. As it is not possible to pay the necessary costs, a new scheme, the "Nuclear Disaster Assistance Act" was passed, and

now actual compensation claims are starting to come in which can be paid using government bonds and burden charges paid also by the eight electric companies other than TEPCO. The total amount can still not be foreseen, but is regarded to be at least around a few trillion yen.

Japan's Nuclear Power in the Future

Japan has 17 nuclear power plants with a total of 54 reactors. Currently operating are 8 power plants and 11 reactors. After the disaster, due to both damages by the natural disaster and to periodical inspections, the total of electricity produced was only 9.95 million kw, which is just 18.6% of the 48.6 million kw produced normally. 18 of the Japanese nuclear power plants were built in the 70s, and 16 in the 80s. The average number of years they are in use is 31 years. If you include the plants built in the 90s and since the year 2000, the average number of years in operation is still 25 years. Aging reactors which have to be decommissioned are actually a problem. If you count security first and assume that in order to be quake-proof a reactor should not be older than 30 years old, 18 reactors should at once be decommissioned. Until the year 2020, 16 more reactors should be decommissioned. More than 60% would be switched off by then. Even if you assume the maximum operation length to be 40 years, the same situation would arise by 2030. As for the 14 reactors which are under construction or at planning stage, ever since the disaster no plans have been in sight to take up work again. In the previous Diet Session, an "Act to implement Renewable Energies" was passed. It is an important task to move forward with the production of energy making use of nature, like solar energy, wind energy, water energy, geothermal power, biomass, etc. One of the pressing issues is the construction of a smart grid through which electricity generated on a small, decentralized scale can be controlled and a stable supply of electricity can be maintained. Japan had the national policy to establish a nuclear fuel cycle. In 1983, a fast breeder "prototype" was launched. In 1991, performance test started, but in 1995, there was a fire accident during which sodium leaked out and the fast breeder was switched off. The research for the "demonstration reactor" which was supposed to follow up is still not launched and the project remains in a stalled state as of today. On the other hand, at the nuclear fuel reprocessing plant in Rokkasho-mura in Aomori prefecture, for which construction started in 1993, there was a lot of trouble at the stage of active trials when highly radioactive vitrified waste was produced. The plant has already cost 2.2 trillion yen, more than three times than originally planned, but construction is still not complete. So far, the completion has been postponed 18 times. The total amount of used fuel stored temporarily at the power stations is 12 840 tons. The maximum amount that can be stored is 19 420 tons. Every year, an additional 1000 tons of used fuel is generated. As we currently have no final disposal site, the nuclear fuel reprocessing plan was pushed forward in the past.

To finish, I would like to give my personal opinion. I believe that as we currently cannot even find a suitable place for an underground geological disposal as a final disposal site, and as the nuclear fuel reprocessing cycle is in a state that

should be declared a complete failure, and as we already have piled up about 46 tons of separated plutonium, which poses a nuclear security problem, and if you consider the risk of how to manage the highly radioactive waste for tens of thousands of years, the fast breeder plan should be dropped and all nuclear power stations should be switched off immediately.

Closing comments

Even though that is my personal opinion, a shift in the way we think about energy within the ruling party and the opposition as well as the parliament, has yet to take place. A dramatic shift, like abolishing nuclear energy as in several EU countries, has not happened yet in the Japanese society. However that getting the local population to support building new reactors and expanding current sites is almost out of the question and even that to put reactors which are currently shut off for inspection back into operation again is not easy is something that is widely agreed upon, including in the mass media. Also, the political leadership is being questioned.

It is becoming evident that it will take many years to reach the decontamination long term goal of less than 1milliSievert per year. True to the principle of "children first", schoolyards (including kindergartens), the paths to school, parks and other areas where children are potentially exposed are of top priority. Right before coming here to Switzerland, on October 12th, I personally went into the off-limits zone, as far as 3km away from the reactor site. I accompanied businesses carrying out their machinery with a special permission. For more than 6 months, this kind of permission to enter this zone had not been given in case of another hydrogen explosion. Radiation levels recorded on the premises were about 10 microSievert per hour, within the building of the factory 5 microSievert per hour and on the grass meadow 179 microSievert per hour. Multiplied by 24hours and 365 days, the calculated level for a year is 1.568 Sievert per year. Those were very serious measuring results, which raise the question of when businesses will be able to go back there to take up their work again.