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The rally, organized by the Executive Committee for 10 Million People's Action to say Goodbye to Nuclear Power Plants, was a very successful and epoch-making event with 60,000 people from all over Japan taking part at the Meiji Park, Tokyo. Sendagaya station, near the park, and the access ways to the park were also filled with people going to take part in the rally. This is the first time the anti-nuclear movement has been able to gather such large numbers of people at one time. Thinking about the past, when we had a gathering two years after the Chernobyl accident, in 1988, it was attended by 20,000 people. That was biggest gathering at the time, but we have now been able to change the situation.

The opening remark was made by Kenzaburo Ooe, a Nobel Prize winner. He said we Japanese are as yet unsafe and we must convince people in the nuclear industry that another nuclear accident is possible by making our voices heard at today's demonstration.

Women and men, younger and elder must become united in their mind and shout with one voice "No Nukes!" The people who participated in this event must have had full confidence that they could change Japan's nuclear policy and bring about a nuclear power phase-out in this country. The Executive Committee is also calling for 10 million signatures by next March.

Rallies were also held in many other locations, such as Nagasaki City, Sapporo City, Nagoya City, Osaka City, Kyoto City, and so on.

Hideyuki Ban (CNIC Co-Director)

Contents

The No Nukes Asia Forum 2011

The No Nukes Asia Forum 2011 was held in Japan over eight days from 30 July to 6 August. During this time, the forum also participated in the International Conference of Gensuikin, Japan's anti-A-bomb organization, on 5 August. It was originally planned to hold NNAF 2011 in Thailand, but following the Fukushima nuclear accident NNAF members from different countries requested that the forum be held in Japan this year.

Around 30 participants took part in the forum from Indonesia, Thailand, India, the Philippines, Taiwan, and South Korea. The following is a brief description of the large number of events that took place during the eight days in Japan.

On 30 July, a seminar was held in order to share the current situation and the impacts of the Fukushima nuclear accident with the participants. Following an outline of the accident, presentations were given by Mr. Seiichi Nakate, who is working to protect children from radiation exposure, Ms. Ayako Ohga, a resident of the evacuation zone, and from Mr. Kazuoki Ohno, who analyzed the impact of the nuclear accident from the viewpoint of farmers and agriculture. An intense exchange of opinions and Q&A session was held following the presentations.

On 31 July, the forum broke up into two groups, one attending a seminar on the question of Japan's exports of nuclear reactors at Waseda University in Tokyo, and one group participating in the "Prefectural People's Rally to Demand a Non-Nuclear Fukushima," held in Fukushima City. Doubts were expressed about participation in the rally due to the relatively high level of radiation in Fukushima City, but it was decided to let potential participants judge for themselves whether they would participate or not on the basis of knowledge of the radiation levels in the city. The Taiwan participants in the rally carried Geiger counters, borrowed from the government, and wore dosimeter film badges, during the event. The group participating in the rally also made study visits to Date City and Minami Soma City.

On 1 August, country reports were heard from participating countries, including a report from China. For NNAF 2011, it was decided to ask each of the participating countries to submit a country report in a unified format in order to deepen the awareness of the electrical power and nuclear power policies and the efforts of the anti-nuke movement in each country.

The Fukushima nuclear accident has had a serious impact on the plans for nuclear power station construction in Asia. In his country report on Indonesia, Dian Abraham noted that the accident has shocked people in his country who are used to being told that Japan's nuclear power stations are safe, and people who were previously apathetic towards nuclear power projects in Indonesia have begun to express feelings of concern and anxiety.

A Thai participant, Santi, stated that a public opinion poll conducted in Thailand at the end of March showed that 83.4% of the people opposed nuclear power. A Taiwanese participant, Gao Chengyan, reported that on 20 March about 5,000 people had taken part in a demonstration in Taipei, a nationwide anti-nuke demonstration had taken place on 30 April and on 11 June, in response to a call from Japanese activists, an anti-nuke demonstration had taken place at main train stations throughout Taiwan.

Mitzi Chan, the participant from the Philippines, told the forum that the revival of the Bataan nuclear power station project, or an attempt to locate it elsewhere by conducting feasibility studies for nuclear power station siting in 13 locations in the country, was underway. In the week following the Fukushima nuclear accident, however, continual demonstrations had taken place in several locations, including in front of the gate at Bataan nuclear power station.

I Honsok, from South Korea, also noted that demonstrations had been organized on consecutive days in many locations in South Korea following the explosions at the Fukushima accident site on 12 March. Dr. Udayakumar from India reported that he has formed a nationwide network to oppose planned nuclear power stations in his country. It is clear that the anti-nuke movement is becoming more active in all of the participating countries.

The country reports were followed by discussions and the announcement of a Joint Declaration. The Declaration, under the title "Let us join hands to create a nuclear-free world," called for a strengthening of solidarity of NNAF and demanded that countries that have nuclear power stations decommission them immediately, while countries that are planning to construct nuclear power stations completely rescind the plans. It was noted that opposition is taking place in areas where nuclear power station construction is planned in several countries, but that the voices of the people not been able to influence the behavior of central governments.

On 2 August, the group visited the Ministry of Economy, Trade and Industry to express opposition to Japan's nuclear exports, and this was followed by a visit to the Head Office of TEPCO to present a list of requests. The forum then moved to Hiroshima.

On 3 August, the forum made a study visit to exchange opinions with the residents of Iwaishima Island, who are opposing the planned Kaminoseki nuclear power station in Hiroshima Prefecture. On the Island, the participants helped to take down the tents that had been set up as a long-term protest and lookout point on Tanoura beach (directly opposite the nuclear power station construction site) and helped to clean the beach. The aim of this activity was to encourage the Chugoku Electric Power Company to completely terminate construction, which is currently suspended, although the geological survey of the site ordered by the government (the Nuclear Safety Commission and the Nuclear and Industrial Safety Agency) is still continuing intermittently. While the participants may not have been aware of the full historical weight of the long history of opposition to the nuclear power station, it did seem that everyone was left with a strong impression of the anti-nuke movement in the area. On 4 August, the group

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Aiming for Renewed Agriculture in the Chernobyl Disaster Area

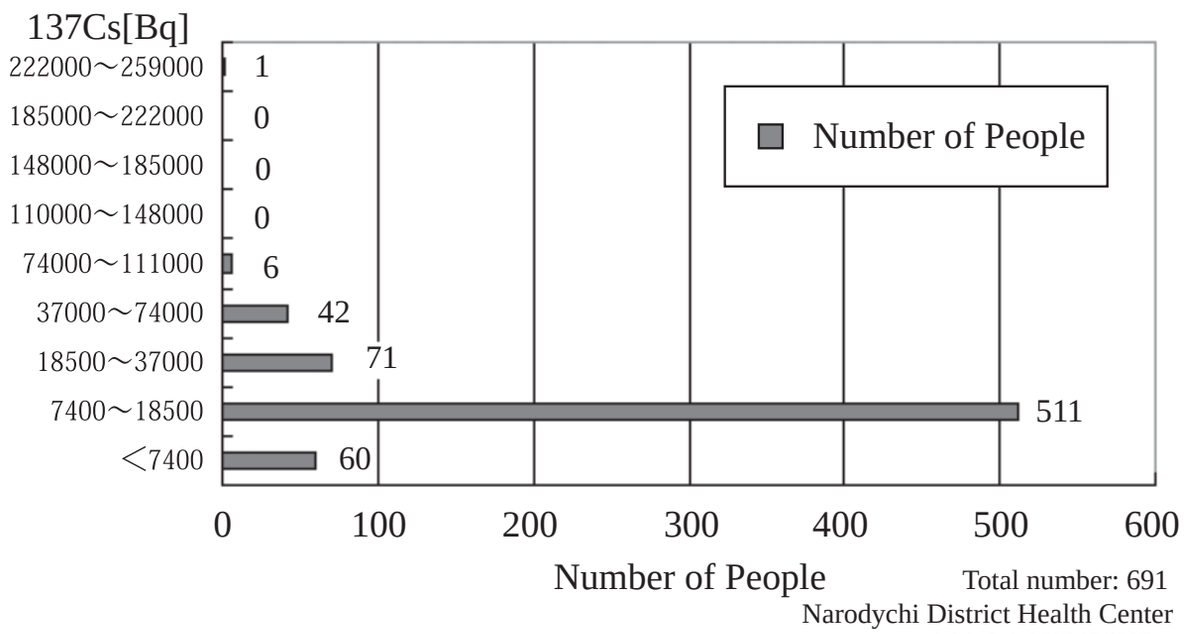
Masaharu Kawata (The Association To Help Chernobyl, Chubu-District, Japan)

Background

The Association To Help Chernobyl, Chubu-District, Japan has been helping victims of the Chernobyl accident in the Ukraine since 1990. The fact that the accident occurred before the disintegration of the Soviet Union contributed to the overwhelming lack of supplies immediately after the accident. Our activities included provision of medicine and medical equipment to the disaster area, and medical support to the liquidators and other victims. The Ukraine became independent and, as its economy recovered, the medical situation gradually improved. We have been supporting the Zhytomyr Oblast Children's Hospital for many years. Setting up an intensive care unit has helped to improve treatment for the children, who come from throughout the province, and death rates have fallen.

However, we wrestled with the dilemma that the incidence of disease in the contaminated areas continued to rise with no fundamental solution to the problem in sight. We took the view that the cause of the elevated disease rate was the

Figure 1 : Radioactivity in the bodies of people living in Narodychi district (2001)



Total number: 691
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visited the Hiroshima Peace Memorial Museum and other places of interest in Hiroshima.

At the International Conference of Gensuikin on 5 August, reports were given on nuclear exports from Japan and South Korea, and the energy policy of Taiwan. There were also reports from the USA and Germany. Baerbel Hoehn, vice chairwoman of the German Green Party and a member of the German Federal Parliament, urged Japanese activists to work patiently toward their goal of a nuclear phase-out and stated that she believes that it is important to always think and act in an alternative way. It appears that the greatest impact of the Fukushima nuclear accident has been in Germany, where the decision has been taken to implement the early decommissioning of nuclear reactors which had recently had their operational lives extended. On 6 August, the group participated in demonstrations starting from the Peace Memorial Park and took part in the anti-nuke sit-in in front of the Chugoku Electrical Power Company office.

With the help of many people in both Tokyo and Hiroshima, we were fortunate in having no illnesses or injuries during the forum despite the very busy and exhausting schedule. This was especially due to the hospitality of our friends in Hiroshima, who agreed to host the NNAF in their city. The success of the forum was also due to the hard work of those who undertook the work of drawing up paperwork for visa formalities, applying for subsidies to hold the forum and taking care of the overseas participants during their stay in Japan. We are also very grateful for donations, which were sufficient to pay for the entire activities of the forum.

It has been confirmed that plans to hold the next NNAF in South Korea in March 2012 are now moving forward.

Hideyuki Ban (CNIC Co-Director)

residents' internal exposure to radiation. Fifteen years after the accident, the quantity of radioactive cesium in the residents' bodies was high, from a few thousand to several tens of thousands of becquerels (see Figure 1). The reason for this was clearly diet.

Zhytomyr Province's Narodychi region lies 70 km southwest of the Chernobyl nuclear power plant. In some areas, radioactive contamination of the soil exceeds the range for the "zone of guaranteed voluntary resettlement" (185~555 kilo becquerels per square meter (kBq/m^2)) and falls within the range for the "zone of obligatory resettlement" (exceeding 555 kBq/m^2). In the Soviet era about two-thirds of the residents resettled, but after the Ukraine became independent, government-supported resettlement ceased due to the dire economic circumstances. Voluntary resettlement was promoted, but due to the collapse of agriculture and the livestock industry, the main industries in the area, about 10,000 people had to remain in the region. We have been supporting these people. Their problems will not be resolved until their internal radiation doses are reduced. This dilemma led us to embark on a new program.

1. Planting rapeseed in contaminated soil

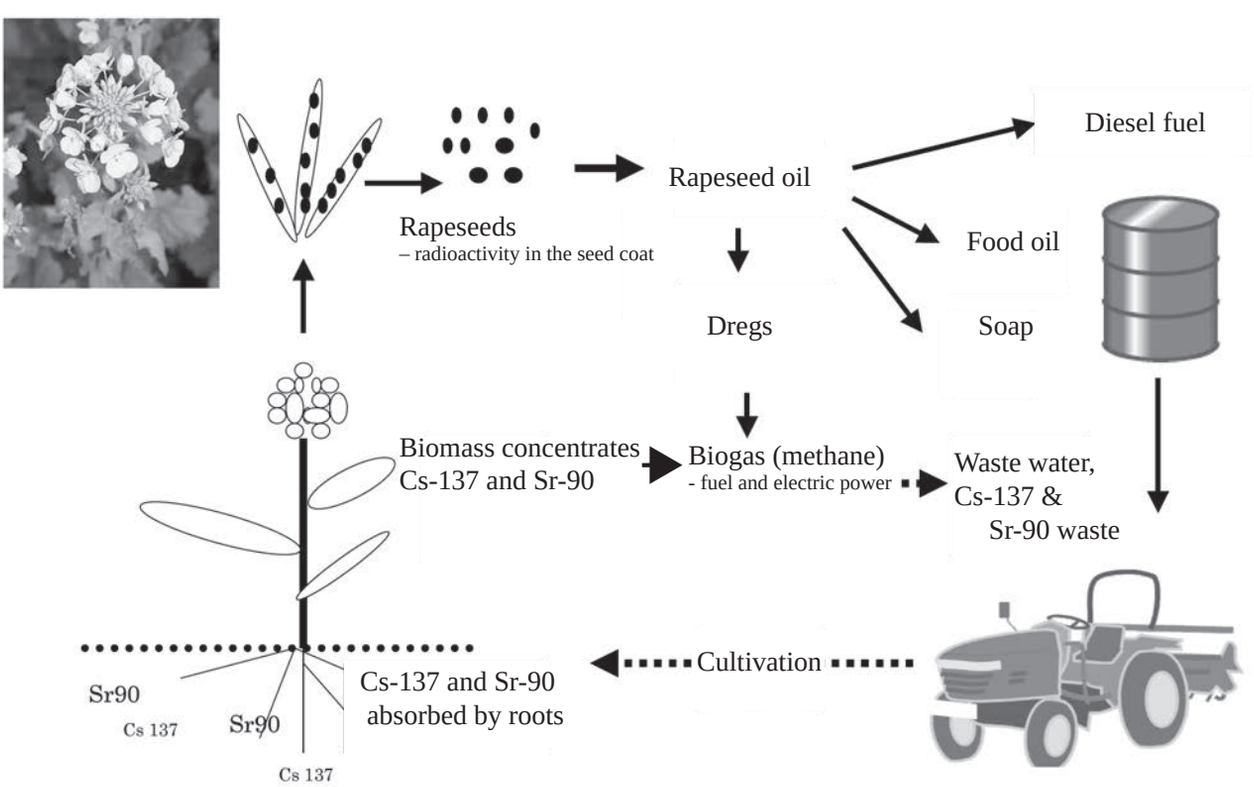
Bioremediation is a method of reducing soil contamination by using living organisms. Research on how to deal with soil contamination has been carried out since the era of atmospheric nuclear weapons tests and there is a large literature on the topic. We studied the issue for one year in search of possibilities. However, most of the literature is related to experimental cultivation by university research organizations. Experience of work with real contaminated land was virtually non-existent.

There was no alternative for us but to approach our project in an experimental fashion. Furthermore, when we visited the region, although the agricultural collectives at the time owned vast tracts of land, tractors could not be operated satisfactorily due to the lack of gasoline and diesel fuel.

Fortunately, our group included people who for many years had been involved in the local energy self-sufficiency movement in Nagano Prefecture's Ina City. They had experience in the production and operation of biodiesel and biogas. If we could make use of these skills we thought we might be able to link bioremediation with bioenergy production in Narodychi. Thus was born the Narodychi Restoration and Nanohana (Rape Blossom) Project.

Twenty years after the accident, in the weakly acidic podzolic soil of Narodychi, cesium 137 (Cs-137) has penetrated about 20 cm, while strontium 90 (Sr-90) has penetrated to a depth of about 40 cm below the surface of the soil. We are using the absorbent power of plants to remove these radionuclides. Cesium is chemically similar to potassium, while strontium is chemically similar to calcium. Plants absorb both elements without distinguishing between them. Hence, generally speaking, plants with a

Figure 2 : Soil decontamination and bioenergy production using rapeseed (concept diagram)



high concentration of potassium will be effective absorbers of cesium. Bearing in mind the way we planned to use the plants, we chose rapeseed.

We extract rapeseed oil and use it to produce biodiesel fuel (BDF) and then ferment the dregs, which contain radioactive material, and other biomass to make methane for biogas. The radioactivity in this process is water-soluble. It ends up in the biogas waste liquid and is absorbed by treatment with zeolite, which is then disposed of as low-level radioactive waste. The plan is to create a cycle by coupling bioremediation with bioenergy production.

2. Implementation structure

All kinds of local support are necessary in order to carry out the program. We were able to obtain the full cooperation of the Zhytomyr National University of Agriculture and Ecology in Zhytomyr City in establishing the conditions for cultivation and for radiological and chemical analysis. The Narodychi district soil contamination control station, under the Ministry of Emergency Situations, is undertaking rapeseed cultivation and daily management. BDF production equipment is also located and operated there. The NPO Chernobyl Hostages Fund, with which we have been working for a long time, is in charge of the overall management of funds. The Narodychi district administration office has also been very accommodating by granting various types of approval.

The rapeseed field, located in Narodychi district's Stare Sharno Village, has been provided rent free. It is in a zone 2 area with radioactive contamination in excess of 555 kBq/m^2. Residence is prohibited in this zone and in fact no one lives in the village now. BDF equipment is not yet widely available in the Ukraine and so had to be transported from Japan. Made by MSD Corporation of Tendo City in Yamagata Prefecture, it can produce 200 liters of biodiesel fuel in three and a half hours. Since there was no pre-existing biogas equipment, the people from Ina City designed and manufactured it themselves during an extended stay.

The equipment is experimental. The fermentation tank has a volume of 8 m^3, and has a planned production capacity of about 2 m^3 per day. The system was completed, but many problems awaited us during actual implementation. I will not go into the details, but suffice it to say that the main problems related to the approvals system remaining from Soviet days and the lack of independence of people who had grown up under a communist system that was in place for many years.

3. Rape blossom project commenced

Left for over twenty years Narodychi was overgrown with weeds. We began preparing the soil in the spring of 2007. In April we planted two hectares of rapeseed (Brassica napus). While we were preparing the soil large numbers of storks came and ate the contaminated worms and insects. The birds could not avoid internal radiation exposure, but we sowed our seeds in the hope that a time will come when they will be able to eat clean food.

Rapeseed had never been grown in this soil. The people believed that growing rapeseed would damage the soil. In the spring of 2006, when we went to carry out a preliminary survey, by chance we found a place where a large quantity of Indian mustard (Brassica juncea) was growing naturally. This convinced us that rapeseed would grow here. In order to find the conditions for maximum absorption of Cs-137 and Sr-90 we tried cultivating the rapeseed under many different fertilizer conditions. We experimented with five different conditions: (1) a reference area with no fertilizer, (2) a complete fertilizer area with nitrogen, phosphorous, potassium and calcium, (3) an area with just nitrogen, (4) an area with nitrogen and phosphorous, and (5) an area with nitrogen and potassium.

From each area we took samples of the soil, the growing and harvested rapeseed and carried out chemical tests on the roots, stems, pods and seeds. Associate Professor Nikolai Didukh of Zhytomyr National University of Agriculture and Ecology supervised all the analyses, which were carried out by researchers and postgraduate students. There are two types of rapeseed in the Ukraine, one planted in spring and one planted in autumn. We took a total of 800 samples in the year in order to analyze both types.

The quantity of rapeseed harvested and the degree to which radioactivity was absorbed was greatly affected by rainfall during the cultivation period. We therefore decided to continue the program of data analysis for five years before making a judgment. We produced reports of the results of our analyses each year and will produce our final report, which will include a policy proposal, by March 2012. The total cost will amount to several tens of millions of yen. Beside donations from members, we have received support from organizations including the international volunteer fund of the former Postal Services Agency, the Japan Fund for Global Environment, Mitsui & Co. Ltd. Environment Fund, and The Takagi Fund for Citizen Science. The project is listed on the following page of Mitsui & Co. Ltd. Environment Fund's website: *(http://www.mitsui.com/jp/en/csr/contribution/fund/results/ActivityGrants/1194565_2851.html)*

4. Results of rapeseed cultivation analyses

The average soil contamination to a depth of 40 cm below the surface was 500~1000 Bq/kg for Cs-137 and 100~150 Bq/kg for Sr-90. The concentration of Sr-90 was between one fifth and one tenth that of Cs-137. By comparison, the concentration of Sr-90 in Fukushima is so low

that it can be disregarded. This is thought to have occurred due to the temperature of the explosion at Chernobyl being much higher than that of the explosions at Fukushima.

The quantity of rapeseed harvested was 1.5 ton/ha for the spring planting and 3.0 ton/ha for the autumn planting. The weight of biomass other than seeds was 1.7~2 times the weight of the harvested seeds. The increased harvest for the autumn planting reflects its longer growing period; from October to the following July. The quantities harvested were almost the same as in Japan. What about the contamination of the rapeseed? Although there was some variation depending on the fertilizer conditions, the highest concentration of Cs-137 contamination was found in the seeds (200~800 Bq/kg).

Sr-90 contamination also varied between the different parts of the plant, the stem being the most contaminated part (300~400 Bq/kg). Sr-90 was absorbed more effectively than Cs-137. That is related to the fact that strontium is more soluble than cesium in the soil.

The so-called transfer factor for Cs-137 (seeds) was 0.6~2.0, while for Sr-90 (stems) it was 2.5~3.2. (Note on terminology: In the regions of the former USSR, radioactivity in Bq/kg in the rape plant ÷ radioactivity in the soil in Bq/kg is referred to as the accumulation factor, whereas the transfer factor is radioactivity in Bq/kg in the rape plant ÷ radioactivity in the soil in kBq/m^2.)

A very interesting phenomenon from a scientific perspective was observed in regard to the absorption of Cs-137. During the growth period up until flowering, Cs-137 is spread evenly throughout the plant's biomass, but when the seed forms and harvest approaches the distribution undergoes a big change, with nearly 60% of the Cs-137 in the plant's total biomass moving to the seeds. This is a new discovery whose biological mechanism needs to be studied. No such trend was observed for Sr-90.

In regard to the effect of fertilizer, potassium tends to suppress the absorption of Cs-137, while nitrogen fertilizer greatly enhances the absorption. However, in terms of the whole biomass, the largest quantity was absorbed in the complete fertilizer area. As predicted, when rapeseed oil was produced, both Cs-137 and Sr-90 were below detection level (less than 6~7 Bq). Most of the radioactive material remained in the dregs. This indicates that even when cultivated in contaminated regions rapeseed oil can be used safely. It is also possible to use it to make food and soap, but we are producing BDF and using it in the tractors and trucks in our own fields.

The big question was, what would happen to the level of contamination of the soil. The conclusion is that it is impossible to dramatically reduce the amount of Cs-137 and Sr-90 in the soil in a short period of time. Rapeseed cannot absorb more than 1~3% of the contamination in the soil each year, meaning it would take decades to decontaminate the soil. That is because 20 years after the accident Cs-137 and Sr-90 are tightly bound to the soil particles and there is little soluble material for plants to absorb. It is believed that this is closely related to the nature of the soil, so it is necessary to check whether or not the same applies to soil in Japan.

5. The possibility of renewed agriculture in contaminated soil

Decontaminating the soil is difficult, but a new discovery has opened up the possibility of resuming agriculture in contaminated soil. There are problems with continuous cropping of rapeseed, so it is not possible to cultivate rapeseed on the same soil every year. It is necessary to plant rapeseed on a 3~4-year rotation. During the intermittent years the soil must either be left fallow or planted with other crops. We planted soba (buckwheat), rye, oats, barley and wheat.

As a result of our analyses, despite our feeling of hopelessness that it would be possible, we obtained a clue for resuming agriculture in the contaminated area. The level of contamination of the secondary crops was in all cases extremely low. Even in fields where the contamination level in rapeseed had been 500~700 Bq/kg, radioactivity in the secondary wheat crop was below detection level. For the other crops also, the level of Cs-137 (10~50 Bq/kg) was within the level permitted under the Ukraine's food standards. For Sr-90 the level of contamination (20~40 Bq/kg) exceeded the standard (20 Bq/kg) in some cases, but such a concentration would not be a problem for livestock feed.

This result is due to the fact that rapeseed planted in the first year absorbed the soluble material. It takes time for Cs-137 and Sr-90 bound to the soil to become soluble again and reappear. This discovery indicates the possibility of renewed agriculture in farmland which had been abandoned for many years and where people had given up hope of agriculture because of contamination. Just because there is contamination does not mean that people have to give up hope of agriculture. By adopting a rotation of rapeseed (or other absorber crop) → secondary crop 1 (easily contaminated crops can be used) → secondary crop 2 (crops which are not easily contaminated) → rapeseed, it is possible to cultivate crops without contamination, while at the same time gradually decontaminating the soil.

When I visited the Ukraine for a meeting this July, the Governor of Zhytomyr Province announced to the press, "We rate highly the results of the joint research between Japan and the Ukraine, and from next fiscal year we will begin cultivation of rapeseed and bioenergy production on 300,000 hectares of this province, including in contaminated areas." That plan is now being prepared. It is our great desire to make use of our Ukraine experience in Fukushima.

Difficult clean-up operations at Fukushima Daiichi Nuclear Power Station

The struggle with highly radioactive water continues

Tokyo Electric Power Co. (TEPCO) announced on August 29 that the amount of highly radioactive water processed by the decontamination system at Fukushima Daiichi Nuclear Power Station (FDNPS) in the one week from August 24 through 30 totaled 10,970 m^3, the highest volume since the system became operational. TEPCO also said the system's operation rate was 89 percent.

At the same time, the plant operator said a total of 32 problems had occurred in the decontamination system during the period June 1-August 13, including water leaks, sudden rises in radiation levels and breakdowns of the system. Various other types of problems that had been unexpected at the start of operations also occurred, including operational errors, troubles caused by inappropriately established work procedures and improper installment of equipment by inexperienced workers.

On August 29, TEPCO announced that two of its workers had been irradiated with more than 15 millisieverts (mSv) of beta radiation while replacing filters on a system for decontaminating radioactive water. They are in their 20's and allegedly absorbed doses of 23.4 and 17.1mSv respectively.

On the morning of August 31, two TEPCO subcontractor workers were sprayed with highly radioactive water. They were handling parts of the decontaminating system produced by Kurion, a U.S.-based nuclear waste management company. One of the workers wearing non-waterproof protective gear called Tyvek suffered a radiation exposure of 0.16mSv, and the other, wearing a waterproof parka, suffered a 0.14mSv exposure. They were using a hose in an attempt to drain radioactive water from a vessel designed to absorb cesium. They removed the hose from the vessel, believing that the valve of the vessel was closed, but the valve was still open, and they were thus sprayed with contaminated water.

Later in the day, it was reported that highly radioactive water was leaking near the device for separating mud and slime from processed water in the decontamination facility installed by the French company, Areva, and the clothes of a TEPCO subcontractor worker became wet. The worker was not wearing waterproof gear for protection against radiation exposure at the time.

The Nuclear and Industrial Safety Agency of the Ministry of Economy, Trade and Industry has concluded that TEPCO's measures to protect its workers from radiation exposure were insufficient and has ordered the firm to improve its measures. TEPCO said the workers had been engaged in work to depressurize the container, which they had used in the facility, before putting it in storage. At the time, contaminated water leaking from the pipe fell on their arms. According to TEPCO, the water did not penetrate through their clothes and their arms did not become wet. As a result, the workers simply suffered an external exposure of 0.89mSv. In Areva's decontamination facility, where mud and slime are separated in two stages, the water leak occurred in the second stage. The radiation level of the processed water was relatively low at that stage because most of the mud and slime had already been separated and removed.

High radiation levels above 10Sv detected at piping connected to an exhaust tower

TEPCO announced on August 1 that extremely high radiation levels of at least 10Sv/hr, or 10,000mSv/hr, the detection limit of the measuring equipment, were detected near the surface of piping connected to an exhaust tower located to the west of the Units 1 and 2 buildings.

On August 2, TEPCO also announced that it had found another high-radiation spot nearby, where a radiation level exceeding 10Sv/hr was detected. Moreover, the utility said a radiation level above 5Sv/hr was recorded inside the Unit 1 building, which was connected by the same piping to the two spots where the radiation levels over 10Sv/hr were registered. The radiation levels exceeding 5Sv/hr were the highest ever recorded inside a building on the plant grounds.

The three workers who measured the radiation levels were exposed to up to 4mSv of radiation, TEPCO said.

A possible cause of the high radiation spot cited by TEPCO was that gas containing highly radioactive materials still remained inside the piping following venting conducted on March 12. The vent was carried out to reduce the pressure within the containment vessel of Unit 1 in order to protect the vessel from destruction. Another possible cause was that highly radioactive particles might have stuck to the outside of the piping during the venting process, the utility said.

TEPCO has limited access to the highly contaminated areas and has said the findings would not affect restoration work at the plant. However, if the workers carry out work in areas very close to the highly contaminated spots, their total radiation exposure would reach the lethal level of 7Sv within 40 minutes.

An increasing number of areas with extremely

high levels of radiation will probably be found in the future, especially in or near Unit 3. The reactor was using the mixed oxide (MOX) fuel that contains a large amount of plutonium, and its air dose rate is higher than that of Unit 1. A full-scale search for such high-radiation spots around Unit 3 has yet to be conducted and there still remains great concern over heavy radiation exposure for the plant workers. (Table 1)

A desirable system of long-term health management for plant workers

Of the workers who began working at FDNPS in or after April, three have already received more than 50mSv radiation doses from external and internal exposure. This indicates that there is a need to promptly repeal the 250mSv radiation exposure limit for the plant workers engaged in emergency operations.

In June, the Ministry of Health, Labor and Welfare summoned a committee on long-term health management for workers at TEPCO's FDNPS. Since then, the ministry has been working on the issue, following the "Temporary approach policy for measures for people affected by the nuclear accident" announced by its Nuclear Disaster Countermeasures Headquarters on May 17. This policy calls for the creation of a database that enables long-term tracking of radiation doses absorbed by all plant workers engaged in emergency operations even after they change jobs, and provision of long-term health management for the workers. On August 3, the ministry made public its "grand design for long-term health management for workers at TEPCO's Fukushima Daiichi Nuclear Power Station," which was formulated on the results of discussions at the committee meetings in June and July.

In the third meeting of the committee, on August 9, the ministry presented a draft plan for long-term health management to be provided for plant workers in proportion to the amount of radiation doses absorbed. The plan calls on the employers of workers engaged in emergency operations to provide workers with ordinary health management. For workers exposed to radiation totaling 50mSv or more, the plan calls for a regular eye checkup once a year, and for workers exposed to a total of 100mSv or more, examinations of the thyroid, stomach, large intestine and lung for cancer once a year, in addition to the eye checkup.

The grand design says that workers exceeding a certain level of radiation exposure will be eligible for these medical checkups. This probably means that only those who have absorbed more than 100mSv or 50mSv radiation are allowed to take the periodic checkups. Among workers engaged in emergency operations, there are some who have no data on their cumulative radiation exposure doses, or who have no accurate data on exposures. Moreover, the majority of the plant workers will not be eligible for regular heath checkups provided by the state after they leave their current job. We must not allow the government to draw the line between workers with cumulative radiation exposure doses of more than 100mSv or 50mSv and workers who have absorbed lower levels of radiation. Since workers are carrying out emergency operations in an extremely dangerous environment created by the disastrous accident, it is necessary for the government to have a strong sense of responsibility in providing all workers with life-long health management and compensation for damage to their health. It is also necessary to launch a system in which all the plant workers obtain a health-record book that will entitle them to receive periodical medical checkups, including those for cancer, even after they leave their current jobs.

Mikiko Watanabe (CNIC)

Table 1 ; Total value of external and internal exposure levels of emergency workers at Fukushima Daiichi NPP.

Level [mSv]	March			April			May			June		
	TEPCO	Subco-ntractor	Total	TEPCO	Subco-ntractor	Total	TEPCO	Subco-ntractor	Total	TEPCO	Subco-ntractor	Total
250～	6	0	6	0	0	0	0	0	0	0	0	0
200～250	0	2	2	0	0	0	0	0	0	0	0	0
150～200	12	2	14	0	0	0	0	0	0	0	0	0
100～150	66	15	81	0	0	0	0	0	0	0	0	0
50～100	190	112	302	0	3	3	0	0	0	0	0	0
20～50	525	331	856	9	71	80	2	19	21	0	17	17
10～20	508	496	1004	20	287	307	9	137	146	1	95	96
～10	345	1128	1473	592	2540	3132	268	2561	2829	182	1686	1868
Total	**1652**	**2086**	**3738**	**621**	**2901**	**3522**	**279**	**2717**	**2996**	**183**	**1798**	**1981**
Max (mSv)	670.4	238.4	670.4	45.6	69.3	69.3	24.8	41.6	41.6	11.9	38.7	38.7
Ave. (mSv)	31.1	15.5	22.4	2.3	4.2	3.9	2.5	2.9	2.9	1.1	2.5	2.4

(Based on TEPCO report of Aug. 31)

Kashiwazaki-Kariwa Nuclear Power Plant
Experience of the Chuetsu-Oki Earthquake not Applied

—The First Post-3/11 Niigata Prefecture Earthquake and Ground Condition Subcommittee—

Sadao Kaneko (The Niigata Prefecture People's Association to Protect the Homeland and Life)

Introduction

In the 1970s the Japanese government produced "The Earthquake Safety Regulatory Guide: Reviewing the Seismic Design of Nuclear Power Reactor Facilities" for commercial power reactors. In September 2009, this was drastically revised as "The New Guideline." The task of checking whether nuclear facilities built before that time would be sufficiently safe under "The New Guideline," nicknamed the "Earthquake Safety Back-check," has been undertaken by a special committee in the Nuclear and Industrial Safety Agency (NISA) of the Ministry of Economy, Trade and Industry. It is intended that back-checks be carried out for all nuclear facilities in Japan. The back-check for Fukushima Daiichi Nuclear Power Station was completed in 2009 and approved by the Nuclear Safety Commission. "The New Guideline" is supposed to provide a sufficient safety function against a standard seismic movement (Ss) value of 600 gal maximum acceleration in order to "Stop, Cool, and Contain" nuclear facilities.

The following is an exchange of arguments in the central government's earthquake safety commission two years ago. It is quite clear that discussions in the commission were insufficient.

"(Committee member, Mr. Okamura) Firstly, I'd like to refer to the interplate quake for which you took into consideration the Shioyazaki-Oki Earthquake in the 1930s. I think you know this, but I would like to confirm that this was the site of the Jogan Earthquake, or Jogan tsunami, if you like. It is known, and the results of research have been reported, at least on the tsunami of around 869AD, that it was overwhelmingly greater than the Shioyazakioki Earthquake. I would like to ask you why you did not mention this at all?"

"(Mr. Nishimura, Tokyo Electric Power Company) With regard to the quake in the Jogan era, looking at it from the point of seismic movement, our major concern is that it did not cause much damage. Further, as for the scale, since it was at the same level as an M7.9 quake, we think from the viewpoint of seismic movement evaluation there would be no problem in studying it this way." (The proceedings of the 32nd for the Seismic and Structural Design Subcommittee, June 24, 2009.)

What did the Jogan Tsunami tell us?

In the URL given below we can see a detailed simulation of the Jogan tsunami presented by the Active Fault and Earthquake Research Center and the Earthquake Research Center of Tokyo University on the basis of their joint research.*(http://unit.aist.go.jp/actfault-eq/seika/h21seika/pdf/namegaya.pdf).*

The simulation shows that a vast area of the Ishinomaki and Sendai plain in Miyagi Prefecture and the estuary of the Ukedo River in Fukushima Prefecture were completely inundated by the tsunami. The data in the fault model of the interplate quake amounts to 200 km in length, 100 km in width and 7m slippage. It shows that a 300 km long fault would cause the water level not only of Sendai Bay but also along the coast line of Fukushima to rise.

However, there was no opportunity for the findings concerning the Jogan Earthquake disclosed in January 2010 to be taken into account in the seismic safety evaluation. It is also regrettable that committee member Mr. Yukinobu Okamura (Director of the Active Fault and Earthquake Research Center), who had pointed out Tokyo Electric Power Company's (TEPCO) deficiencies withdrew his criticisms. Whereas under the guideline of Nuclear Industry and Safety Agency's fault evaluations for the Late Pleistocene, or between 120,000 and 130,000 years ago, are supposed to be considered, this Jogan Earthquake occurred only about one thousand years ago. TEPCO thus reiterated its arrogant claim of calling the center fault of the Chuetsu-Oki Earthquake "a dead fault." Committee members such as Mr. Yoshihiro Kinugasa (member of the Committee of Technology and Subcommittee on Earthquake and Ground Condition of Niigata Prefecture), who sided with the group that minimized the fault evaluation, did not even glimpse at the Jogan Earthquake. Moreover, they went so far as to claim that the Futaba fault should be measured as shorter than it actually is.

Did a fault presumed to be immovable move?

"The Earthquake and Ground Condition Subcommittee" was held on August 11, after a break of five months. As the Great East Japan Earthquake had occurred in Japan's northeast region during the previous meeting there was a very tense atmosphere and the focus was on how the members would view the circumstances after 3/11 and how these would be reflected in the arguments for Kashiwazaki-

The deep crack in the ground surface running southeast beyond the road. *(From the National Institution of Advanced Industrial Science and Technology website)*

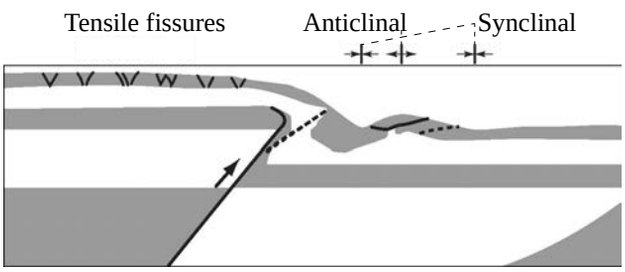
Kariwa NPP (KK NPP). But TEPCO's report was disappointing. It aimed to prove that "there was no fact that suggested changes in the previous fault evaluation because GPS monitoring around the nuclear plant site showed that after the Great East Japan Earthquake the distortion tended to work in the direction of relaxing the fold (tension)" and concluded that there was no necessity to change their view that the Madogasaka fault, which extends right into the nuclear plant site, was immovable.

It was clear that TEPCO intended deflect the point of the discussion, since a presumably immovable fault had moved. On April 11, an M7 quake struck close to Iwaki City, in the Hamadori region on the coast of Fukushima Prefecture, causing the Idosawa and Yunotake faults to move and the earthquake fault to appear at the surface of the ground. TEPCO had formerly held that "the Yunotake fault has been inactive since before the Late Pleistocene (about 120,000 to 130,000 years ago)" on the grounds that the outcrop study revealed no displacement variation or deformation in the stratum distribution that covered the fault." It did move, however, and the quake fault appeared at the surface of the ground. According to an analysis by the Earthquake Research Center of Tokyo University, a characteristic "tensile stress condition" was formed on the hanging wall of the fault by the extremely large-scale tectonic deformation of the M9 quake. If this is true, then the safety evaluation would have to be reviewed. This evaluation claimed that the (Madogasaka) fault "would not move" because the boring survey proved that the volcanic ash deposit of the Yasuda stratum (more than 130,000 years old) was deposited horizontally, crossing over the Madogasaka syncline.

Formation of fault and fold

According to the earthquake safety evaluation, if the fault belt that connects the South Sadoshima fault, the F-D fold group and the Takada-Oki fault group were destroyed in one movement, the whole length of the zone would be 70 km to 100 km. These are reverse faults that tilt east and extend directly beneath KK NPP. The degree of displacement is quite a bit larger than the F-B fault which defines the standard quake movement. With this in mind, Mr. Tateishi (member of the Committee of Technology and Subcommittee on Earthquake and Ground Condition of Niigata Prefecture), pointed out, "I think we need an evaluation for a linked fault movement up to the Takada-Oki fault. Then we need to discuss and find out why the fault that we had evaluated as immovable did actually move. Looking only at the result (of the Great East Japan Earthquake) will not help us get to the point." Admitting that the present evaluation is 'peripheral,' Mr. Hijikata, head of TEPCO's Architecture and Earthquake-Resistance (Anti-Seismic) Technology Center, stated that he would like to explain the matter in the report produced on the basis of NISA's instruction."

What was of interest was that he explained the fault activity that would occur in the nuclear plant site if the Madogasaka fault became active with reference to a model experiment by the Central Research Institute of Electric Power Industry on the morphological development of overlapping strata faults and folds that would occur in association with reverse fault displacement.



A study on the development process of a reverse fault-active fold belt by model experiment. *(Source: Central Research Institute of Electric Power Industry report)*

In the figure above, the reverse fault corresponds to the Madogasaka fault and the tensile fissures correspond to the fault underneath the nuclear plant site. The reactors and the turbine buildings at KK NPP stand right over this fault. A thoroughgoing review of what would happen if the fault underneath the plant site moved is necessary.

Needless to say, KK NPP stands right on top of the concentrated distortion zone on the eastern margin of the Sea of Japan. Although it is yet to be accepted as established theory, this zone is the borderline region between the Eurasian Plate and the North American Plate. It can be seen that the subduction is still shallow and a sea trench is not yet formed. Both the Chuetsu Earthquake (2004) and Chuetsu-Oki Earthquake (2007) were caused by the strain of compressive forces directed towards the earth's crust from the Sado bank on one side and the Echigo mountain range on the other.

It so happened that thirteen hours after the Great East Japan Earthquake, an M6.7 quake occurred at the border of Niigata and Nagano Prefectures. A movement of the Tokamachi west margin fault belt, that seismologists had long been afraid of, inflicted severe damage on the surrounding area, only 40 km to 60 km south of the KK nuclear power plant. Tectonic deformation, as ever, is still ongoing.

Group Introduction

Citizens' Radioactivity Measurement Station (CRMS)

by Aya Marumori *

In Japan we are faced with a big question: "What should we do to protect children from radioactive contamination resulting from the disaster at Tokyo Electric Power's Fukushima Daiichi nuclear power plant?"

The greatest possible efforts are urgently needed in Fukushima Prefecture to protect children not only from external radioactive exposure attributed to the reactor explosions, but also from internal exposure due to contaminated food and water,.

However, government actions have been passive and belated. Authorities have started surveys, but have not announced specific protection measures, which should have been presented for all possible risks. We believe that the following actions are necessary to minimize radioactive risks, but none of them has been implemented – prioritized distribution of clean drinking water to children for an extended period of time, indications of detailed radioactive-contamination data on food items, creation of a food distribution system to deliver less contaminated food preferentially to children, and creation of recreation facilities which will also serve as shelters.

Mothers with small children strongly desire that the authorities take prompt actions to implement protective and preventive measures and protect children, rather than perform surveys. What the authorities should do is create an environment where residents can relax, not try to bluff residents by repeating "Relax, relax." Under conditions where this desire has not been realized, what should the citizens living in municipalities neighboring evacuated and high-radiation areas do to protect children?

We established the Citizens' Radioactivity Measurement Station (CRMS) based on the idea that, to protect children's health, we should not wait for authorities to take action but take preventive measures on our own.

CRMS is an independent organization that provides tools to enable citizens themselves to take measurements with which to protect themselves, to become informed about radioactive protection, and to make their own judgments. The tools include measurement, data collection and disclosure, cooperation with experts, establishment of measurement stations, training in measurement skills, and information concerning external and internal radioactive exposure.

CRMS was founded thanks to the dedication of Wataru Iwata, a member of the Measurement Group of the Fukushima Network for Saving Children from Radiation (Children Fukushima Network), which is a Fukushima-based group of citizens. The CRMS office is located next to the Fukushima Information Center for Saving Children from Radiation. The Information Center was a realization

During a meeting (Person in the center is Ms. Marumori)

of the commitment of Aya Marumori, inspired by Chernobyl citizens' efforts to protect human rights and health (such as the establishment of citizens' health clinics, organization of recreation camps, and establishment of the Chernobyl Information Center). Marumori is a member of the Radioactive Protection Group of the Children Fukushima Network and the author of this article. The first CRMS food radiation detector was donated by Ryuichi Hirokawa (journalist and editor-in-chief of "Days Japan", the monthly photojournalism magazine), who purchased it from the France-based CRIIRAD (Commission for Independent Research and Information on Radioactivity). CRMS now awaits the donation of five more food radiation detectors and one whole body counter. We also plan to establish more CRMS sites in municipalities other than Fukushima City.

CRMS has been measuring radioactivity in food for citizens on a daily basis since the period of preparations for its opening. CRMS has also been organizing children's health counseling events regularly, in cooperation with pediatrician Makoto Yamada (representative of the National Network of Pediatricians for Protecting Children from Radiation). We hope to organize such events in cooperation with sincere physicians living in Fukushima Prefecture.

CRMS is supported by the Days Japan Radiation Detector Project Support Fund, Fukushima Children's Fund, large numbers of donations, and volunteer staff. The Fukushima Daiichi disaster has not yet been resolved. To protect the future of children living in an environment where radioactive contamination is omnipresent, CRMS is making continued efforts to find better protective and preventive measures.

* Representative of CRMS
http://en.crms-jpn.com/

NEWS WATCH

Cabinet establishes Nuclear Safety Agency

On August 15, a Cabinet decision combined the Nuclear and Industrial Safety Agency (NISA) with the Nuclear Safety Commission (NSC) to form the Nuclear Safety Agency, affiliated to the Ministry of the Environment. Up to now, the NSC was an advisory committee to the Prime Minister, and NISA had been affiliated to the Ministry of Economy, Trade and Industry (METI).

For quite some time, there have been strong opinions advocating NISA's independence from METI, which promotes nuclear power. METI was reluctant to allow the separation of NISA, but the situation took on a changed complexion as criticism focused on NISA's approach to the crisis during the early stages of the Fukushima Daiichi nuclear accident. The separation was accelerated when it was discovered that NISA had instructed electric power companies to arrange for nuclear power proponents to express opinions supporting nuclear power at METI-sponsored symposiums and hearings.

The creation of the Nuclear Safety Agency has raised many doubts as to whether its independence can be protected as a regulatory agency. Also, by integrating NSC with NISA, the double-check function of the NSC will be lost, despite the notion that it might be better to strengthen the double-check function. There also remain doubts as to how moving the affiliation from METI to the Ministry of the Environment will solve the problem. While the Ministry of the Environment may not promote nuclear power as forcefully as METI does, since the independence of the new agency cannot be guaranteed, nothing much will change.

More than anything, the problem is that it appears that the same people who staffed the NSC secretariat and NISA are to be transferred to the Ministry of the Environment. With their engrained attitudes toward nuclear power, it is unclear whether or not they will be capable of assuming the consciousness of a serious regulatory administration.

Tomari-3 moves to commercial operation

On March 7, just before the Fukushima Daiichi nuclear accident, Hokkaido Electric's Tomari-3 reactor (PWR, 912MW) began test operations, the last stage of regular inspections. Four days later the accident occurred, and the Governor of Hokkaido, based on concern from the citizens of Hokkaido, told the government not to proceed with the final approval to allow the Tomari-3 reactor to transition to commercial operation. Over five months passed and test operations continued, but then having altered the Governor's stance toward the government, the governor gave the go-ahead, and on August 17 the reactor was considered to have passed inspections and transitioned to commercial operation.

Had the governor not given the go-ahead, operation of the reactor would have stopped, and if nuclear reactors in other areas do not resume operations, by March 2012 all nuclear reactors in Japan could have been in cold shutdown. The Tomari-3 reactor has resumed operation, but if it stops due to an accident it may still be possible that all Japanese nuclear reactors could be in cold shutdown next year.

Transportation of the high-level vitrified wastes to Aomori from U.K.

On September 15, 2011, high-level vitrified waste from Japanese spent nuclear fuel arrived at Mutsu-Ogawara Port in Aomori Prefecture. It had departed from Britain on August 3, 2011, and arrived in Japan via the Panama Canal. In this shipment, 76 vitrified waste canisters were contained in three casks. It is the first shipment of high-level waste to arrive back in Japan since the Fukushima nuclear power plant accident occurred in March. Citizen groups expressed their opposition to the transportation of high-level waste by organizing a protest against the transportation around the port.

Nuke Info Tokyo is a bi-monthly newsletter that aims to provide foreign friends with up-to-date information on the Japanese nuclear industry as well as on the movements against it. It is published in html and pdf versions on CNIC's English web site: http://cnic.jp/english/

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