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Citizens' Nuclear Information Center

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The Nuclear Accident at Fukushima Daiichi Nuclear Power Station

～ Current status of nuclear reactors and corium ～

What is going on inside the reactors remains totally unknown.

It is almost a year (this was written on Feb. 23) since the great earthquake hit the Tohoku region of Japan on March 11, 2011. However, little is known about the current situation inside each of the reactors at the Fukushima Daiichi Nuclear Power Station.

Questions about the reactors that remain unanswered include;

- What damage did the quake cause, and did this lead to a leakage of radiation?
- How many times did tsunami waves hit the nuclear power plant and how far did seawater penetrate into the plant?
- Why did station blackout (loss of external power sources and emergency power sources) occur?
- To what extent are parameters related to the operation of nuclear reactors reliable, including the water-level gauges?
- When did the core meltdown begin?
- Did the containment vessel venting system function properly?
- How did the hydrogen explosions in Units 1 and 3 occur, and what caused the difference between the two explosions?
- How was the containment vessel of Unit 2 damaged? (Did it explode?)
- What caused the fire or explosion in Unit 4?
- How much radiation was released during each of the events (or at what time)?
- What is the current status of the molten fuel, the pressure vessels and the containment vessels?

On December 2, 2011, Tokyo Electric Power Company (TEPCO) released the interim report of the Fukushima Nuclear Accidents Investigation Committee (*http://www.TEPCO.co.jp/en/press/corp-com/release/betu11_e/images/111202e14.pdf*). The report said that no earthquake damage was found in the facilities that are considered to be important from the viewpoint of safety. But that is not the case. There still remain a large number of facilities that have yet to be checked, including the inside of the nuclear reactor buildings. In addition, various data collected while the reactors were in operation strongly indicate that piping in the reactor buildings was damaged.

At the present stage, even if a camera could be put inside a nuclear reactor, it would be extremely difficult to see everything inside, including the condition of the nuclear fuel. The development of a device that enables checking of the condition of nuclear fuel under extremely high radiation levels is contradictory to the construction of a completely isolated and radiation-proof device, because excluding radiation would also mean excluding light. It is also doubtful that such a device would make it possible for us to take a close look at the inside of the containment vessels.

In fact, an attempt was made on January 19 to insert an industrial-use radiation-proof endoscope into the containment vessel of Unit 2 to check the inside of the vessel. However, hardly any important information could be obtained

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about the condition of the melted fuel.

Questionable accuracy and credibility of TEPCO's MAAP analysis

TEPCO has made an analysis of the condition of the cores of Units 1, 2 and 3 using a computer program called Modular Accident Analysis Program (MAAP), developed by the U.S. Nuclear Regulatory Commission. However, it seems that the result of the analysis does not reflect reality at all.

As an example, an attachment to TEPCO's interim report (attachment 10-1 of Japanese report) includes a chart that shows the changes in the Unit 1 data. The chart revealed a contradiction between the result of the MAAP analysis and the collected data. Although the chart is rather big, we will use this chart because it contains a wide range of data and is therefore convenient for explaining the contradiction [see next page]. The chart includes three graphs. The top graph shows changes in the reactor water level, the second shows pressure level, and the third is a graph of the drywell (D/W) and the suppression chamber (S/C) in the containment vessel. Below the graphs is a chart that describes how each piece of equipment was operated from 12:00 on March 11 through 24:00 on March 12. The horizontal axis of the chart indicates time.

Each of the three graphs has two pale blue lines at 18:00 and 19:00 on March 11 respectively. These lines show the result of the MAAP analysis. The analysis indicates that reactor water level dropped to the top of the fuel rods at 18:00, and that the fuel rods became exposed to the air and began to melt at 19:00.

While there are only few data for the water-level measurement in the "E" area, which is surrounded by a dotted line in the reactor water level chart, it would be safe to conclude from the actual data measured with the water level gauge that there was enough water in the reactor to fully cover the fuel rods. The data measured afterwards also show that the water level did not drop to the top of the fuel rods. This means that there is a significant gap between the result of the MAAP analysis and the actual data. TEPCO insists that the water-level gauge was broken at the time and was not able to take accurate measurements. However, there is no evidence to prove that the gauge was broken at the time. Moreover, the MAAP analysis was made based on the assumption that the main safety relief valves (described as SRVs in the analysis) were operated frequently, although there are no records that prove the use or operation of the valves. TEPCO's explanation totally lacks credibility and persuasiveness. It seems that TEPCO carried out the MAAP analysis on the basis of such a questionable assumption because it wanted to prove that a core meltdown could occur even though there was no damage to the plant's piping. It is, however, extremely doubtful that the result of such an analysis correctly reflected what actually happened in the reactor.

Did the temperature in Unit 2 rise?

The temperature in the reactor pressure vessel (RPV) of Unit 2 began rising on February 2, 2012. It exceeded 90ºC on February 13 and continued to rise sharply. According to the charts released by TEPCO, one of thermocouple-type thermometers read more than 400ºC. TEPCO increased the amount of water injected into the RPV to 17.5 tons. As the company increased the amount of water, it also added boric acid to the water in order to prevent recriticality.

The thermometer that showed the high temperature was installed at 0º in a circumferential direction on the upper part of the bottom head of the RPV. However, another thermometer nearby indicated a temperature decline of 40ºC to 30ºC. That is why TEPCO has concluded that one of the thermometers in the RPV registered such a high temperature not because the temperature in the RPV actually rose to that level, but because the thermometer did not work due to disconnection or some other reason.

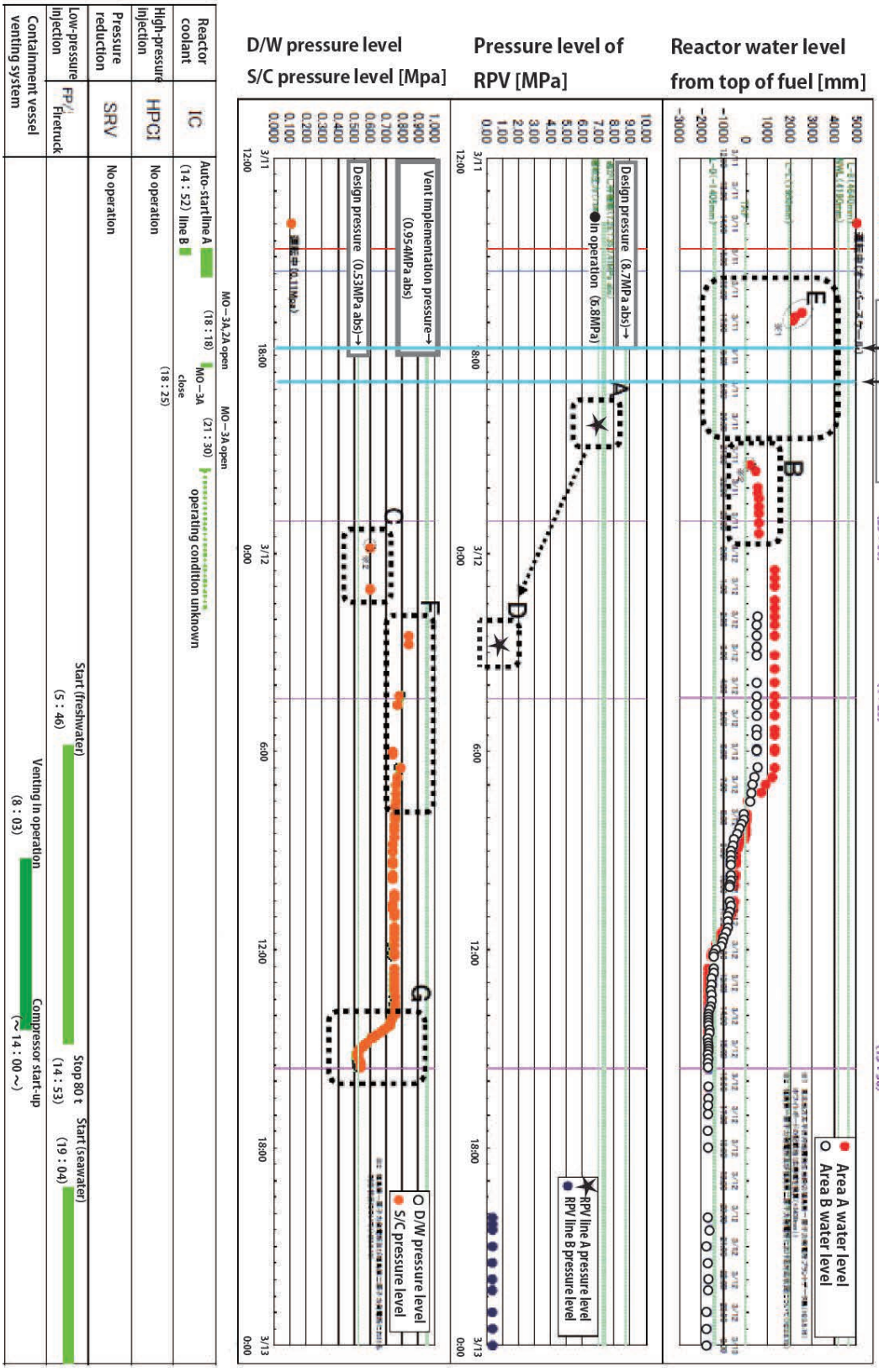
But there is the possibility that molten nuclear fuel moved closer to the thermometer for some reason (operation by staff, earthquake or collapse) and caused the temperature to rise around the thermometer. Another possibility is that there was an active nuclear reaction locally, resulting in the higher temperature. Even if the thermometer was truly broken, we still need to know what caused the breakdown, why such an accident happened at that time, and whether or not other thermometers in the RPV were working normally.

TEPCO's explanation about the extremely high temperature indicated the possible loss of just one thermometer in the RPV, but if we consider the future situation of the RPV, this may be a quite serious problem. Should the loss of measuring instruments continue, it will become more difficult, and eventually totally impossible, to know what is going on inside the reactor. Such a situation would not only make it harder for us to determine how to deal with the molten nuclear fuel, but also make the process of cooling the molten fuel even more unstable. This may lead to a further release of radiation from the reactor.

(Chihiro Kamisawa, CNIC)

Chart showing changes in parameters of Fukushima Daiichi Nuclear Power Station Unit 1

and how each piece of equipment actually operated.



CNIC created this chart based on the attachment to the interim report of the Fukushima Nuclear Accidents Investigation Committee.

Reactor coolant	IC	Auto-start line A (14 : 52) line B
High-pressure injection	HPCI	No operation
Pressure reduction	SRV	No operation
Low-pressure injection	FP/Firetruck	Start (freshwater) (5 : 46) Stop 80 t (14 : 53) Start (seawater) (19 : 04)
Containment vessel venting system		Venting in operation (8 : 03) Compressor start-up (~ 14 : 00 ~)

What are the main issues in future discussions on energy policy?

Departure from a nuclear-dependent energy policy is the right direction for Japan

The disastrous accident at the Fukushima Daiichi Nuclear Power Plant in March 2011 forced Japan to drastically revise its basic energy plan. Following the accident, former Prime Minister Naoto Kan declared that his government would aim to break with nuclear power generation, but his successor government, led by Yoshihiko Noda, toned down the objective to "reduced dependence on nuclear power generation." The work to review the basic energy policy is underway in the midst of this situation. The basic policy drawn up by the Energy and Environment Council stated, "Japan will reduce its dependence on nuclear power generation as far as possible." This sentence can, however, be interpreted in various ways.

After looking back on the discussions held during the past year by the committees to which I belong, I have selected several notable comments made by committee members who support nuclear power generation, and have then added my comments on them.

If the shut-down of nuclear power reactors continues, Japanese businesses will shift their operations overseas.

This comment is based on the following assumption.

Of all the 54 nuclear reactors in Japan, 52 are offline for regular inspection at present (as of February 20, 2012). If this situation continues for a long period of time, greater efforts for energy saving will be demanded this summer. Japanese businesses will then have to increase their budget for introducing home power generation systems or storage batteries, compel their workers to change their work shifts or force them to work on holidays. The higher costs would press the companies to transfer their operational bases overseas.

Yuka Matayoshi, vice president of Morgan Stanley MUFG Securities Co., Ltd. and a member of the New Nuclear Policy-Planning Council of the Japan Atomic Energy Commission, pointed out in a council meeting the negative impact on the economy of the exodus of companies from Japan. She stressed that nuclear power plants are indispensable for Japan and that operation of the reactors should be resumed soon. Masakazu Toyoda, Chairman and CEO of the Institute of Energy Economics, Japan, and former vice minister for International Affairs of the Ministry of Economy, Trade and Industry, expressed a similar view in a meeting of the Fundamental Issues Subcommittee of the Advisory Committee for Natural Resources and Energy.

However, a survey on corporate measures for coping with the electricity supply-demand situation this summer, conducted by the Japan Business Federation (Keidanren) by sending out questionnaires, showed the following results. Asked about effective power-saving measures that can be implemented from now on, none of the respondent companies in the manufacturing and non-manufacturing sectors said the shift of operations overseas was an "effective" or "the most effective" energy-saving step. This means that no firms are planning to move their business overseas. We must therefore conclude that the views of the two committee members are oversimplistic.

Japan should contribute to the international community by using its advanced nuclear-power-generation technology

An increasing number of Asian nations are moving to construct nuclear power plants. This may be partly because Prime Minister Noda said in his address to the United Nations that Japan will try to build the safest nuclear power plants in the world. As a result, some experts say Japan will be surrounded by 100 nuclear reactors in the region sooner or later. Taking this situation into consideration, some business leaders insist that Japan should make the most of its 40-year experience in nuclear power generation when doing business in overseas markets, and in order to do this there is the need for Japan to continue operations of its nuclear power plants.

Their insistence seems to reflect a wish they had before the nuclear accident in Fukushima occurred, which was to make nuclear power plants one of Japan's major export products. In a recent meeting of the New Nuclear Policy-Planning Council of the Japan Atomic Energy Commission, Masaharu Habu, Chairman of the Steering Committee on Nuclear Energy Systems of the Japan Electrical Manufacturers' Association expressed this view, and in the meeting of the Fundamental Issues Subcommittee of the Advisory Committee for Natural Resources and Energy, Shoei Utsuda, Chairman of Mitsui & Co., Ltd., expressed the same opinion.

Does Japan really have high nuclear power technology?

Admittedly some of the small-scale manufacturing factories in Japan have extremely high technology. Japan may thus have high technology for producing some parts and components of nuclear power plants. Yet it is doubtful that Japan has high-level technology in developing whole nuclear power generation

systems.

In the case of the prototype fast-breeder reactor Monju, which was designed and built using domestically developed technology, two major accidents have occurred in recent years due to simple design mistakes. One of them was a sodium coolant leak and a resultant fire, and the other was a 3.3-ton device for fuel exchange accidentally falling into the reactor. Toshiba Corp. was in charge of developing these two sections of the Monju system.

The technology of mixing highly radioactive liquid waste with raw glass material and vitrifying the byproducts into a more solid state is used in the spent nuclear fuel reprocessing plant in the village of Rokkasho, Aomori Prefecture. But a series of glitches involving this vitrification process is causing a significant delay in the completion of the plant. IHI Corp. is in charge of developing this process.

The fact is that Japan has failed to put a domestically-produced nuclear reactor into commercial use, and withdrew from the project to do so in 1995. This indicates that Japan cannot boast an independent national nuclear power generation technology capability.

Nuclear power generation contributes to Japan's energy security

The use of nuclear power has two major significances for energy security. One of these is that nuclear power enables a stable energy supply over a long period of time. Although the uranium used in Japan is entirely imported from other countries, atomic power is considered to be a "semi-domestic" energy. As for oil, Japan's national oil reserve is currently 172 days supply. Uranium, on the other hand, is said to enable Japanese nuclear power plants to continue operations for about two years, even if the supply of uranium was halted. (The two-year period may vary depending on the timing of the halt in the uranium supply.) This means uranium will give the Japanese people more time to devise countermeasures.

The other significance for energy security is that nuclear power will contribute to the diversification of energy sources. Having various kinds of energy sources is believed to lead to a stable energy supply. This view was expressed by Professor Satoru Tanaka of the School of Engineering of the University of Tokyo, Professor Takao Kashiwagi of the Tokyo Institute of Technology's Integrated Research Institute, who graduated from the Dept. of Mechanical Engineering and Science of the Tokyo Institute of Technology, and Masakazu Toyoda.

In the background to this opinion is the obstinate belief that renewable energy cannot become the main energy source of Japan because it is difficult to secure renewable energy on a stable basis. Moreover, if you look deeper into their position, you will notice the intent of the nuclear power industry to contain rapid proliferation of the use of renewable energy in Japan. This intent is symbolized by the fact that the price at which utilities are required to purchase surplus electricity generated from solar power systems is likely to be set by a committee comprised of members who oppose the introduction of this renewable-energy purchasing system.

Although the committee members maintain that they are willing to actively use both nuclear power and renewable energy for the purpose of promoting diversification of energy sources, the truth is that they want to expand the use of nuclear power.

In Japan, the energy that is 100 percent domestically produced is renewable energy. We have four seasons, many mountains and rivers, volcanic zones which are among the world's greatest, and the seas surrounding the Japanese archipelago. It is, therefore, possible for us to introduce various types of renewable energy in forms that are suitable for each region or district. Tetsunari Iida of the Institute for Sustainable Energy Policies (ISEP), Hiroshi Takahashi of the Fujitsu Research Institute, some other committee members and I are jointly demanding the introduction of renewable energy into various regions and districts. In view of this situation, it would not be preposterous to envisage that renewable energy will meet 100 percent of Japan's energy consumption by the year 2050. (Energy-saving efforts will be another key factor for achieving this goal.)

Nuclear capabilities must be sustained as a deterrent

Cited by some committee members, this is the last major reason why nuclear capabilities should be maintained. If we possess nuclear technology, we can develop nuclear weapons. This will strengthen Japan's position in political negotiations with other countries, and prevent attacks from other nations. Some members of the Fundamental Issues Subcommittee of the Advisory Committee for Natural Resources and Energy, including Kenji Yamaji, director-general of the Research Institute of Innovative Technology for the Earth, who graduated from the Nuclear Professional School, The University of Tokyo, and Professor Shin-ichi Kitaoka of the University of Tokyo Graduate Schools for Law and Politics, who graduated from the University of Tokyo Faculty of Law, have expressed this opinion.

Even if we accept their claim that nuclear weapons' capabilities should be maintained as a deterrent, we do not necessarily reach the conclusion that private companies must therefore continue nuclear power generation by forming an industry. Another member of the committee, Mr. Jitsuro

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My Opinion on Radioactive Disaster Waste

Baku Nishio (CNIC Co-Director)

The nuclear disaster cannot be resolved, or at least the resolution will be very difficult, and various problems have erupted. As it is, citizens and residents with no actual responsibility have had resolutions irrationally pushed on them. One issue is the problem of the radioactive disaster waste.

As radiation is released, polluted waste turns into radioactive waste, and the results are not easily anticipated. Large volumes of disaster waste are being irradiated and are becoming radioactive disaster waste. Furthermore, the amount of radioactive materials continues to rise from the "decontamination" of irradiated soil.

And yet the electric power companies and the country had no prepared response to the accident until finally, in August 2011, the establishment of the Act on Special Measures Concerning the Handling of Environment Pollution by Radioactive Materials was announced.

Of course the electric power company was responsible for the disposal of concrete and other materials that were scattered both inside and outside the nuclear power plant area. However, within the Fukushima Prefecture evacuation zone, highly irradiated waste has fallen under the classification "Disaster Area Waste." Incinerated garbage ash and sewage mud containing radioactive cesium exceeding 8,000 Bq/kg is "Specified Waste," the disposal of which has become a national issue ("disposal" here meaning collection, transport, storage and disposal, and includes recycling). All waste not covered by the above classifications becomes the problem of the local municipalities.

Regarding waste within Fukushima Prefecture, the government is making requests to the eight towns and villages in Futaba County and the prefecture to establish intermediate storage facilities within the county. Although it has been clearly stated that a "final disposal site outside the prefecture" will be found, there is no guarantee that this will actually be realized. Rather, as rational voices are also saying, the final disposal could take place within the highly irradiated surroundings of Fukushima-1 and 2 nuclear plants.

From the start, however, even as intermediate storage facilities are being rejected, this has been a difficult problem and the road to resolution is a long one.

Iwate and Miyagi's Disaster Waste

Disaster waste in Iwate and Miyagi Prefectures is classified with the Ministry of the Environment (MOE) as "Requiring Wide-Area Disposal." In Iwate Prefecture, roughly 4,760,000 tons (equivalent to approximately 11 normal years), and in Miyagi Prefecture about 15,690,000 tons (equivalent to approximately 19 years) of waste have piled up, and it is reported that "Temporarily installed garbage incinerators are conducting disposal in the disaster zone, but disposal ability is currently insufficient." It is hoped that about 570,000 tons for Iwate, and 3,380,000 tons for Miyagi can be disposed of through wide area (i.e. to other prefectures) disposal. While it is thought that most of the waste should somehow be disposed of within the prefectures, this will be no easy task.

The Tokyo area has also seen incidents of radioactive waste occurring in normal waste and in incinerated ash in sewage mud, and this waste material is being stored.

Photograph of disaster waste in Kesennuma City, Miyagi Prefecture, on May 1, 2011 (by Mr. Kanada)

Residents of areas where radioactive waste exists and residents of areas who are to be taking in waste are both victims, since neither bear any responsibility for the problem. However, for residents in areas where waste exists, if they cannot have it removed then they will have anxieties over radiation exposure and the waste will be an obstacle to recovery. If the waste is removed, however, the contamination will spread to other areas. For residents in areas to which the waste is to be transported, if they accept the waste they then face fears of radiation exposure, and if they do not accept the waste they could then be accused of blocking the recovery of disaster areas.

Considering the nuclear disaster, these are unanswerable problems. Although involuntarily, the radioactivity has been released. If we must endure this agonizing situation, in what form and to what limits is it to be endured? The answer should be sought in the opinions of the people.

In order to do this, there must be clear information now on how much radioactive disaster waste exists and what the radiation levels are; what categories of waste there are and how urgent the situation is; what problems are anticipated if disposal is delayed, and so on. The very fact that this is a very difficult issue to resolve necessitates that people over a large area be informed, including those who appear to believe that the problem does not impinge on them directly.

No Recycling

Several points should be noted. One is how we think about recycling. According to MOE, "As much as is potentially recyclable" should be recycled. In this context, they are setting the "clearance level" at 100 Bq/kg for radioactive cesium, as set down for nuclear reactor facilities. We believe there is little significance in recycling and oppose the notion that the "clearance level" justifies deregulation for highly dangerous radioactive waste. If we also take into account that this is a time of emergency, we should reach the conclusion that recycling is unnecessary and should not be carried out.

Regarding landfill disposal, the guidelines indicate that the 100 Bq/kg limit was multiplied by 80 for an 8,000 Bq/kg limit. According to a comment from MOE, "The majority of waste cannot be disposed at under the 100 Bq/kg standard." Nevertheless, an 8,000 Bq/kg limit is far too high.

For recycling and landfill, while adopting the clearance level as it is, after landfill the radiation exposure of residents in the vicinity is set at the same annual 10 microsieverts as for recycling, but the workers and residents who work with disposal have a radiation exposure limit of 1 millisievert, 100 times more. It is very hard to say that this has been properly explained.

Is it OK to Simply Incinerate?

Another problem is incineration. If incinerated, radioactive cesium contained within waste is concentrated in the incinerated ash -- a bag filter removes 99.99%, an electric dust collector removes 99.47% (though doubts have been expressed about this removal performance) -- and the remainder is released into the environment together with exhaust gas .

This becomes acceptable when non-radioactive waste is mixed in and the radioactivity diluted, even when it is above the concentration standard. That is how the guidance is being carried out now. Even supposing we trust the removal performance, since large amounts are burned then large amounts of radioactive cesium are released. If incineration is to be approved, then should not at least the use of nuclear plant waste disposal facilities with the same criteria for radioactive removal be mandated, and guidelines on total volume required?

Fundamentally, radioactive disaster waste is the responsibility of the electric power company, and specialist, high-performance storage facilities should be constructed to manage waste according to waste type and prevent scattering and spillage.

Decontamination tied in with the Act on Special Measures

Finally, looking at a different aspect, the problem is complicated by the return of evacuees being tied in with legislation of the Act on Special Measures for radioactive material decontamination.

On January 26, based on the same Act on Special Measures, MOE announced the "Plan for Decontamination of Special Areas." The aim is to implement the decontamination of evacuated areas so that residents can return, but is this not totally the opposite of what should be happening?

Highly irradiated areas exist that have not been designated as evacuation areas. People in these areas should be evacuated, and if there is some reason why this is difficult, then the obstacles should be removed. If there are still people who cannot be evacuated from those areas, then the decontamination of their living spaces should take priority.

This is not to deny that evacuation zones may be decontaminated to enable the return of residents at sometime in the future. However, in my opinion, it would seem to be better to carry out the decontamination of these areas of lesser contamination before thinking about the decontamination of highly irradiated areas.

The Problem of the Meteorological Research Institute's Environmental Radiation Research

～ From a series of articles in the Asahi Shimbun newspaper ～

In the summer of 1954, I was a 3rd year undergraduate helping out at the Meteorological Research Institute, which was then at Koenji, Suginami Ward, Tokyo, measuring radioactivity contained in seawater collected around Bikini atoll. The water had been collected two months after the H-bomb test of March 1, and contained fairly high amounts of radioactivity.

Since that time, I have continued to pay attention to research by the Institute and was wondering why it did not report on the Fukushima Daiichi NPP accident. My question was answered in November.

Sudden notification of research budget cuts

On November 7, 2011, the article "Order No.1 to suspend observations" in the series of articles entitled "The Promethean Trap," published in the Asahi Shimbun newspaper, began as follows:

"On March 31, 2011, Michio Aoyama (58), of the Meteorological Research Institute of the Japan Meteorological Agency, was attending an International Atomic Energy Agency (IAEA) conference in Monaco when he received an e-mail from Japan. Aoyama was stunned to read it. 'We're discontinuing radiation monitoring? Now? But we've been doing it for more than half a century!'

A U.S. thermonuclear test at Bikini atoll in 1954 prompted the Meteorological Research Institute to begin nuclear research that year. In 1957, the Institute began monitoring environmental radiation in the atmosphere and the oceans, which was never discontinued and was still going on when Aoyama received the disturbing e-mail. The undertaking had already set a world record as the longest of its kind, and the Institute had earned the respect of other countries for its activities.

Why do we have to stop? Why at this time of all others?

The sender of the e-mail was Takashi Inoue (47), a researcher at the institute's Office of Planning in Tsukuba, Ibaraki Prefecture. According to Inoue, he received an unexpected phone call from the Meteorological Agency's Planning Division in Tokyo at 6 p.m. on March 31.

The caller told Inoue, 'Effective tomorrow, there will be no more budget for radiation monitoring. Please do as you see fit at your end.'

Inoue could think of no reason why the budget was pulled just when radiation level readings were at their highest in the history of monitoring. He "demanded an explanation, but the caller merely repeated that 'the agency's decision was irreversible.'"

This was hardly an acceptable notice at that particular time, when it was necessary to address the problem of the Fukushima NPP crisis with all possible knowledge. Why was budget allocation withheld from researchers who have been largely dedicated to the field of environmental radiation studies?

Is the publication of research outcomes to be suspended?

A paper on "The Effects of Radioactive Substances Released from the Crippled Fukushima Nuclear Plant into the Marine Environment" by three researchers, Michio Aoyama, K. Buesseler (of the U.S. Woods Hole Oceanographic Institution), and Toshiro Fukazawa (of the Marine Research Development Organization) had been submitted to Nature, the U.K.-based science magazine. The journal was interested in the report and had agreed to publish it.

The salient points of the paper are: Cesium 137 concentration in seawater registered 1,000 to 50,000 Bq/m^3 near the Fukushima nuclear plant's effluent drain; 50 Bq along the Fukushima coast; and 1 to 50 Bq 30 km offshore. These measurements are higher than the level of contamination from atmospheric nuclear testing by several orders, and higher than in the Black Sea and Baltic Sea following the Chernobyl nuclear accident by at least one order of magnitude.

On April 18, when the draft paper was finished, Aoyama showed it to his superior, Mr. Midorikawa, head of the Geochemical Research Department. "I don't see any problem," said Mr. Midorikawa as he affixed his seal to the publication authorization form. But things were not that simple. The next day, Aoyama was called in by Hiroshi Nirasawa, head of the Office of Planning, to explain the content of the paper.

On the 25th, accompanied by both men, Aoyama faced Yuji Kano, Director General of the Institute.

Kano: "The Chernobyl accident data pertains to the sea contaminated with radioactive substances that were carried there via rivers running hundreds of kilometers. I must question the scientific validity of comparing it to the condition in the sea offshore from Fukushima."

Aoyama: "The radioactive substances from the Chernobyl accident reached the sea via rivers. But radiation doesn't diminish much in rivers, regardless of the distance it travels."

Aoyama explained that radiation levels near the Fukushima plant's affluent drain

were nearly 10,000 times higher than those in the Black Sea, but 30 km off Fukushima, the radioactive substances were diluted in the seawater to almost to the same level as those found in the Black Sea.

The dialogue went on until Kano finally decided that he would not authorize publication of the paper by Aoyama with the byline of "Researcher of the Meteorological Research Institute of The Japan Meteorological Agency" unless he deleted the lines concerning the comparative analysis with the Chernobyl accident.

Had the report been published in Nature, a significant finding by Japanese researchers would have been put before the eyes of a worldwide public at an early date. However, the chance was lost and I feel very sorry about this.

A canceled oral presentation at an academic meeting, and other issues

In early July in Tokyo, when the Japan Radioisotope Association held "A Workshop on Radioisotope and Radioactivity Research," the Association planned to have a session on the effects of radioactivity released into the environment and the role of scientists. The Association intended to have Aoyama make a presentation, since he was one of the participants, and requested the Meteorological Research Institute to dispatch Aoyama as a lecturer. The Institute's Planning Division refused the proposal, saying it did not have enough time to follow the official procedures. Instead of Aoyama, the Association found a researcher from another organization, and this person made a presentation quoting Aoyama's research data on the contamination of sea water.

In early June, it was decided that Japan and the U.S. would collaborate to investigate radioactive contamination in offshore Fukushima seawater for two weeks. Although Aoyama was planning to participate in this investigation, he was ordered to decline.

Another case I heard was that newspaper companies contacted Aoyama and his colleague Yasuto Igarashi for interviews. However, the names of the two researchers never appeared in newspapers, possibly because of intervention by the Meteorological Research Institute authorities. The Institute tried not only to bar publication of the paper, but also the presentation of a reliable research result, I suppose in order that those would not reach the eyes of a wider public.

Research budget recovered too late.

On June 28, an Upper House Member, Ms. Yuko Mori, visited the Meteorological Research Institute and spoke with Aoyama and others. The November 18 article in the series goes as follows:

According to Aoyama, Mori took out her cell phone during the briefing and made a call. "I presumed she was calling the Science and Technology Ministry. I heard her yell, 'Just tell me what's going on with the budget!' or something to that effect," Aoyama recalled.

Soon after that, a notice from the Science and Technology Ministry that the budget for radioactivity research study had been restored came to the Meteorological Research Institute. The budget had been recovered.

I understand that suspension of the research budget had a strong impact. The research by Aoyama and others was seriously damaged by the loss of budget. There were cases in which they had difficulty purchasing research equipment or could not pay personnel costs for research assistants. I heard that they laid analyses aside and managed to hold firm on sampling during the period when the budget was frozen.

The reason given for the budget recovery was certainly phony, and no doubt the true reason for the research budget suspension in the first place was that the authorities did not want the research results to be made open.

Although so-called "data cover-ups" are often talked about, in this case at the Meteorological Research Institute, restrictions were aimed at the obtaining and publishing of data. Why did this happen at this specific time?

Depending on how you look at it, the Fukushima Daiichi NPP accident was the worst ever in the history of nuclear accidents. The Japanese government must inform the whole world of the present situation and the future prospects for Japan's nuclear plants. I hope the government will respond to this issue in a serious manner.

Michiaki Furukawa (Member of CNIC Board)

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Terashima, President of the Japan Research Institute Ltd., insists that there is a need to nationalize the nuclear power sector. He cites as the reason for this the fact that China and South Korea are continuing to promote an active nuclear power policy and that soon Japan will be surrounded by 80 nuclear reactors. He stated that it was therefore unrealistic for Japan alone to withdraw from nuclear power since it would mean a loss in diplomatic bargaining power.

The active move among the Asian countries to introduce nuclear power generation indicates that those countries will eventually obtain a nuclear deterrent. But it is hard to see how this makes it possible to presume that this is the right direction for Japan.

Despite the fact that recent public opinion polls show that 70 percent of Japanese citizens wish to see a discontinuation of nuclear power generation, the committee members are expressing different views as though the disastrous nuclear accident had never occurred. This is a deplorable situation.

Hideyuki Ban (CNIC Co-Director)

Anti-Nuke Who's Who

Masaharu Kawata of the Association to Help Chernobyl, Chubu-District, Japan.

~An activist-scientist who strives to inform citizens in a wide range of fields ~

by Kyoko Tomura*

In April 1990, four years after the 1986 Chernobyl nuclear disaster, Mr. Masaharu Kawata became one of the founders of the Association to Help Chernobyl, Chubu-District, Japan. Mr. Kawata was already well known as an anti-nuclear energy activist in Aichi Prefecture from before the Chernobyl accident, and was an active member of the anti-nuclear energy citizens group 'Kinoko no Kai.'

After the Chernobyl accident, he became involved as a citizen scientist in lectures and study groups for citizen activists. He answered questions such as "What happened in the Chernobyl accident?" and "In what ways is radiation dangerous?" He did not mind making efforts to explain elementary questions to people who wanted to know. Amongst others, he implemented study groups for parents raising children, in which the now classic "Why Plutonium is Dangerous" by Jinzaburō Takagi was used as a text. Mr. Kawata explained all the difficult words in a friendly way. He was a popular teacher because he was easy to understand. After the Fukushima accident, he began once again to travel around Japan giving lectures.

Besides the nuclear problem, Mr. Kawata has also acted against a number of pollution issues in Japan and around the world. He gave support to citizens in the Yokkaichi Asthma trials (1969-1972) and the Fujiwara district cement pollution trials (1970-1982). From 1980 he carried out investigations into environmental pollution in Taiwan, Korea, China and the Philippines. In 1987, he lectured on the pollution problem in Taiwan at a symposium at Chicago University. In May 1990, he also testified at the Upper House Budget Committee on the pollution problem in the Philippines. Mr. Kawata has worked as a citizen activist both inside Japan and overseas.

As a specialist in molecular biology, in 1995 Mr. Kawata became the spokesperson of the GMO Information Service Japan, an organization that gathers and distributes information on genetic engineering technology. In May 2009, he acted as a spokesperson for citizens groups at the Cartagena Protocol on Biosafety and brought forward problems using down-to-earth survey activities.

The support activities for victims of the Chernobyl accident were carried out at the time by an NGO on a trial and error basis. There were heated discussions with the Ukrainian counterpart 'Chernobyl Hostages' on self-help, and compromises had to be made at times. After working as an activist in for 20 years, Mr. Kawata wanted to break away from the series of involvements in radioactive pollution, sickness, poverty and aid. After his proposal in 2007, the Nanohana (Rapeseed) Project was started to help revive soil polluted with radioactive material in the Norochizi area. This year will be the fifth year of the experiment, and the results are expected to help revive the radioactively polluted soils in Fukushima.

**Board member of the Association to Help Chernobyl, Chubu-District Japan*

NEWS WATCH

Proposal within the Democratic Party of Japan to stop the nuclear fuel cycle

The Study Group on Nuclear Back End Issues was formed by 70 people, of whom 18 are DPJ members of parliament. The group is headed by Sumio Mabuchi, a member of the Lower House and former Minister of Land and Infrastructure. On February 7, the group submitted its first proposal to Chief Cabinet Secretary Osamu Fujimura at the prime minister's official residence.

The proposal stated that Japan should withdraw from the linear view of the nuclear fuel cycle that posits "Operation of a reprocessing plant → Construction of a demonstration fast breeder reactor → Construction of a commercial fast breeder reactor." Regarding spent fuel, the proposal states that, "Until a final disposal method can be found in the future, waste material should be stored in a responsible manner." The proposal also adds that, "However, the possibility of seeking fuel cycle technology through international cooperation will not be denied."

The proposal also called for "the suspension of the operation of the Rokkasho Reprocessing Plant for the time being" and "suspension of the usage of plutonium in thermal reactors for the time being." Finally, on the Monju Prototype FBR, the proposal stated, "An action plan for bringing research to an end should be drafted, after which a discussion on how to handle the issue, including the possibility of international research on the matter, can be started from scratch by specialists."

In an interview with the Tokyo Shimbun published on February 26 Mr. Mabuchi stated regarding the nuclear fuel cycle, "It must be said that it has been a fiction. The 54 commercial nuclear plants nationwide have been operating just as if the nuclear fuel cycle could be used. While we still have this fiction as a premise, nuclear power plants cannot be stopped and even voices to restart the temporarily halted nuclear plants are raised."

Group within the Liberal Democratic Party propose withdrawal from nuclear power.

On February 9, the LDP parliamentary group on energy policy (one of the representatives being Diet member Tarō Kōno) drafted a proposal to abandon nuclear power. The proposal was presented to the party's Special Commission on Energy Policy, lead by Ichita Yamamoto.

The proposal calls, amongst others, for the following: "No new commercial nuclear power plant construction or renewals," "Closure of nuclear plants that have been running for more than 40 years," "No governmental support for the export of nuclear power plants," "Construction of a facility for the long-term dry storage of spent fuel," "Closure of the Monju fast breeder reactor," "Suspension of the development of commercial fast breeder reactors," and "Closure of the Rokkasho Reprocessing Plant before any further operation takes place."

Draft bill of law to overhaul nuclear energy organizations presented to parliament

On January 31, two bills for restructuring nuclear energy organizations were signed and sent to parliament by cabinet decision.
The most important points are;

1. The Nuclear and Industrial Safety Agency will be separated from the Ministry of Economy, Trade and Industry (METI), reformed as the Nuclear Regulatory Authority and placed under the Ministry of the Environment.
2. The Nuclear Safety Commission, now under the Cabinet Office, will be abolished and a Nuclear Safety Investigatory Commission will be established as an advisory body to the Minister of the Environment in order to act as a watchdog to the Nuclear Regulatory Authority.
3. The operation of nuclear power plants will be limited to 40 years. However an extension of a maximum of 20 years will be allowed.
4. Clear indication that regulations exist "to protect people and the environment from harmful radiation."
5. Safety regulations will be changed to include the possibility of major accidents.
6. The latest knowledge will be used (or "reflected") in existing facilities. (This knowledge may not be expressly stated in laws, but will be entrusted to Ministry of the Environment notifications that will be produced after laws have been passed.)
7. Enhancement of the disaster prevention system.

Of these, points 4 to 7 can be judged as not going far enough. However, points 1 to 3 contain major problems. Firstly, regarding point 1, the removal of the Nuclear Regulatory Authority from the nuclear energy-promoting METI to the Ministry of the Environment does not guarantee an independent position. Regarding point 2, the Nuclear Safety Investigatory Commission will not be under the Ministry of the Environment but will simply be one part of a secretariat that performs this function as well carrying out self-assessment on the situation regarding the implementation of regulations under one section of the Nuclear Regulatory Authority. This will make it impossible to guarantee the independence of the Commission. Finally, regarding point 3, the 40-year operation limit, there is a three-year grace period for extension procedures from the date of implementation of the amendment of the law. Within this grace period all nuclear power plants, including the ones over 40 years old, are permitted to continue operation.

International Conference on Nuclear Safety in December

On February 17, the Minister of Foreign Affairs, Kōichirō Gemba announced that in the light of the Fukushima nuclear accident an international conference on nuclear safety will be held in Fukushima Prefecture from December 15 to 17. The conference will likely be held in Koriyama City, and will be co-hosted by the IAEA. On December 15, an official ministerial level meeting will be held, and meetings of specialists will take place on December 16 and 17.

Budget proposal for nuclear energy doubling to handle accident

On February 14, the Cabinet Office calculated the costs relating to nuclear energy for the 2012 budget proposal. Compared to the 433 billion yen for last year, the amount will be more than doubled to 883.9 billion yen. Of this amount 56%, 494.5 billion yen, has been reserved for decontamination, monitoring of radiation and other costs related to the Fukushima nuclear accident. The remaining budget is 10% lower than that of last year. The budget for developing fast breeder reactors is 30 billion yen, 25% lower, and 50.4 billion yen has been proposed for the establishment of the new Nuclear Regulatory Agency.

Request for Referendum on Nuclear Energy

On February 14, a petition with 55,000 valid signatures was presented to Osaka Mayor Tōru Hashimoto. The petition for a referendum on nuclear energy was drafted by a citizens group. It was announced on February 9 that the same kind of activity in Tokyo has resulted in 300,000 signatures. This petition will be presented to all of the election committees of wards, cities, towns and villages in the Tokyo Metropolis. If the petition is judged to be valid it will be presented to Shintarō Ishihara, the Governor of Tokyo.

Rally attended by 16,000 antinuclear protesters in Koriyama City, Fukushima Prefecture. (March 11, 2012)

Both Mayor Hashimoto and Governor Ishihara are opposed to a referendum. The chances of a referendum actually being held by the City Council of Osaka or the Tokyo Metropolitan Assembly are unfortunately slim.

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