NUKE INFO TOKYO

July/Aug. 2008
No. 125

Citizens' Nuclear Information Center

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The Streets of Kashiwazaki - Photo by Toach

No Nukes Asia Forum 2008

No Nukes Asia Forum 2008 (NNAF08) was held in Kashiwazaki-City and Tokyo from June 28-30. It coincided with a national gathering in Kashiwazaki to mark the first anniversary of the Chuetsu-Oki Earthquake, which struck the Kashiwazaki-Kariwa Nuclear Power Plant on July 16, 2007. Activists from Indonesia, South Korea, Taiwan, Thailand and Europe came to Japan to participate. They joined Japanese activists in public meetings and a parade through the streets of Kashiwazaki.

From the window of the bus coming into Kashiwazaki City it appeared that most of the damage to the city had been fixed, but at close range the NNAF08 participants could see where the ground had subsided leaving a great big crack at the base of their hotel's steps. They heard from local opponents of the Kashiwazaki NPP about the damage to their homes and to the nuclear plant and, in particular, about the danger that serious damage would not be revealed by Tokyo Electric Power Company's (TEPCO) inspections. For activists from countries in the Pacific Rim of Fire, this was all priceless information to take back home and use in their own campaigns. Japan might hold the world record for the most plants sitting on top of active faults, but, as we learned from the presentations of NNAF08 participants, there is no shortage of harebrained schemes to build nuclear power plants in other earthquake-prone parts of the region.

The focus of the presentations varied greatly from country to country. The following comments give a general overview. More detailed information about the nuclear plans of Indonesia, Thailand and South Korea are included at the end of the article. The new government in Taiwan has not yet given a clear indication of its future plans.

Eight people from Taiwan participated. They told us the history of their struggle: how they managed to delay construction of Taiwan's fourth nuclear power station for many years, but were unable to kill it off completely. In 1996 the Legislative Yuan (parliament) submitted a bill opposing the station, but they were unable to stop construction, because the pro-nuclear Kuomintang (KMT) was in power at the time. The Democratic Progressive Party came to power in 2000 and took steps to stop construction, but the Constitutional Court ruled that the project

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could not be stopped because a budget had already been allocated to it. Citizens groups responded by demanding a referendum, but the Referendum Law passed by the Legislative Yuan in 2003 included effectively unachievable conditions. With the election in March this year of the pro-nuclear KMT government, it appears that construction of the partially built fourth power station will be completed.

Four people from South Korea participated. They focused on their struggle against nuclear waste dumps, power uprates for existing plants, plans for new plants and South Korea's ambition to be accepted into the elite club of fuel-cycle countries. For many years they succeeded in blocking the government's attempts to find a site for a nuclear waste dump, but eventually, through a combination of bribery, misleading promises and referendum rigging, a site was selected. However, unlike previous plans, the site is only for low and medium level waste, so the problem of spent fuel and other high level waste remains. Like Taiwan, South Korea also has a newly elected pro-nuclear government. Besides power uprates, the Grand National Party government has an aggressive plan for new nuclear construction.

Six people from Thailand and two people from Indonesia attended NNAF08. Neither of these countries has nuclear power plants yet, but both countries have declared that they want to build plants in the near future. Both countries' nuclear power ambitions can be traced back several decades, but earlier plans were abandoned in the late 1990s when strong domestic opposition and the Asian financial crisis made it impossible to proceed. These plans have been resurrected in recent years and civil society is responding once again with vigorous opposition campaigns. The participants from Thailand and Indonesia were well informed, experienced activists, but they were very eager to learn from their counterparts in countries which already have nuclear power plants.

Readers of Nuke Info Tokyo are well aware of the issues facing the Japanese movement, so it is not necessary to go into great detail here. However, there is one very important difference between Japan and the other countries represented at NNAF08. Japan is the only one of these countries with a complete nuclear fuel cycle. In fact, Japan is the only country in the world that does not have nuclear weapons, but which does have a complete nuclear fuel cycle (leaving aside questions of whether or not it is a functioning fuel cycle). As CNIC's Co-Director, Hideyuki Ban, pointed out, that does not mean there is no connection between Japan's nuclear fuel cycle policy and nuclear weapons. He said, "Japan's policy is closely connected to its geopolitical circumstances. Located between three nuclear weapon states, America, Russia and China, Japan's desire to acquire the ability to produce nuclear weapons was probably behind its policy choice."

NNAF08 was held at a crucial time for the Asian movement against nuclear energy. Rabidly pro-nuclear governments have been elected in South Korea and Taiwan and, as in the past, it was a military coup in Thailand that led to the resurrection of that country's nuclear power plan. Japanese government and industry are keen to cash in on orders for new nuclear power plants in the region. Even as NNAF08 was being held, the Japanese government was twisting arms of G8 leaders to have nuclear power included in the statement from the Summit in Toyako, Hokkaido.

It was against this backdrop that on July 1, one week before the G8 Summit, NNAF08 participants handed a letter to officers of the Ministry of Economy Trade and Industry and the Ministry of Foreign Affairs. The letter demanded that:

1. Countries with nuclear industries such as Japan, not give permission or support for proposals to export nuclear power plants and related technology, including to Asian countries;
2. Transfers of energy related technology, including to Asian countries, be restricted to renewables and energy efficiency, and not include nuclear technology;
3. Climate and energy policies not be based on promotion of nuclear energy, but on renewable energy and energy efficiency;
4. Financial support mechanisms for measures to prevent dangerous climate change not include nuclear energy;
5. In order to avoid the risk of major accidents caused by earthquakes, existing nuclear power plants should be closed and construction of new nuclear power plants should be stopped.

The full text of the letter is available on the following web site:
http://cnic.jp/english/topics/asia/nnafstate1jul08.html

Jan Beranek, from Greenpeace International, explained to participants why nuclear energy is not the solution to global warming. According to an energy scenario recently produced by the International Energy Agency, even if 32 gigawatts (32x1000MW plants, or 2.6 plants a month) of nuclear power were added globally each year to 2050, Greenhouse Gas emissions from the energy sector would only be reduced by 6%, or less than 4% of global GHG emissions. Besides being of no use in

addressing climate change, nuclear energy actually undermines the development and introduction of effective measures to avert global warming: increase of energy efficiency and promotion of renewables. Furthermore, centralized electric power systems based on nuclear energy obstruct the introduction of small-scale and decentralized energy systems.

This message must be communicated clearly and insistently to the people of the Asian region. Asia is viewed by proponents of nuclear power as one of the most promising regions for construction of new nuclear power plants, so it is vital that we counter their propaganda. Judging from the success of NNAF08, there is every reason to be optimistic.

Philip White (NIT Editor)

Information from Country Presentations at NNAF08

Indonesia *(Dian Abraham, MANUSIA)*

"After the fall of Soeharto, and despite the sentiment of anti New Order regime during the so-called reform era, the nuke plan was covertly prepared by the same advocates of nuclear in BATAN and its newly-formed counterpart, Bapeten (Nuclear Regulatory Board), as well as the Ministry of Research and Technology."

"In 2004 the Minister of Research and Technology announced the revival of the plan to build nuclear power plants...A year later, the Department of Energy and Mineral Resources confirmed the plan by issuing the Blueprint of National Energy Management 2005-2025. By the signing of Presidential Regulation no. 5 year 2006, the plan has become a final decision of the executives."

"According to the new scenario, nuclear energy is classified under the category of "new and renewable energy". The role of this category shall increase from 0.2% in 2005 to 4.4% by 2025. Nuclear energy will share almost half of it, about 2%. The bidding for the first two plants is scheduled in 2008 and the construction will be started in 2010. By 2016, the first NPP is expected to be in operation, followed by the second and so on until 2025."

"Similar to the non-transparencies of the nukes plan during 1990s, the plan today is somewhat unclear...1. Muria NPP plan in Balong village, Jepara district, Central Java province...2. Nuclear Desalination Plants in Madura Island, East Java province...3. Floating NPP plan in Gorontalo province, northern part of Sulawesi Island...4. NPP in East Kalimantan..."

Thailand *(Santi Choakchaichamnankit, Alternative Energy Project for Sustainability)*

"In early 2007, the military government has approved the new Power Development Plan (PDP). The PDP proposes a long-term national power development plan in the next 15 years. According to the plan, the government would be committed by its policy to build 4,000 MW nuclear power plants in the year 2020-2021."

"In order to operate the nuclear power within the year 2020, the government has planned four-phase action plans:
Phase 1 (2008 - 2010): Conducting public campaign; public relations
to achieve public acceptance of nuclear power
Phase 2 (2011 - 2013): Setting up the nuclear power plant projects
Phase 3 (2014 - 2019): Having nuclear power plant constructions
Phase 4 (2020 - 2021): Operating nuclear power plants."

"The government has not yet specified the prospect locations to construct the power plants. However we realize that their targeted locations would be around Chumporn, Ranong, Surat Thani, and Nakhon Sri Thammarat in the southern part of Thailand, in which the people are not aware about this issue."

"For the past few years, we have established the Sustainable Energy Network Thailand (SENT) in order to campaign about the state's shortcoming energy policy. Our network consists of a number of small NGOs that are AEPS, Palang Thai, Confederation of Consumer Organization Thailand, and some academics."

South Korea *(Lee Heon-Seok, Korea Eco-Center)*

Twenty reactors are now operating. According to the 2008 Nuclear Power White Paper, eight new reactors, including six currently under construction, will be completed by 2016. Four of these are APR 1400s, two of which are currently under construction. In addition, a further two APR 1400s are planned to be completed by 2020.

A life extension has been completed for Kori-1 and is planned for Kori-2 and Wolsung-1.

The National Energy Master Plan, which the government is now preparing, proposes to increase the "nuclear power equipment rate" from 26% in 2007 (17,716 MW nuclear out of a total of 68,268 MW) to 29% in 2020 and 37~42% in 2030.

The new South Korean government is very keen to develop a nuclear fuel cycle based on pyro-processing.

KK Investigation Committees: the Debate Rages On

July 16 was the first anniversary of the Chuetsu-Oki Earthquake. What caused the earthquake? What damage was done to the Kashiwazaki-Kariwa Nuclear Power Plant (KK)? Discussion of these questions is continuing within the central government's investigation committee and Niigata Prefecture's two investigation committees, but answers are proving very difficult to find. There is still no agreement between the experts. There are those who prioritize social and economic factors, such as Tokyo Electric Power Company's (TEPCO) losses, Kashiwazaki City's troubled finances and the wider impact of KK's extended closure on nuclear energy in general. These people want to restart the plant as soon as possible. On the other hand, there are those who want to make sound technical judgments on a strictly scientific basis.

Below is an account of the current state of debate within Niigata Prefecture's two committees.

1) Determining the design-basis earthquake ground motion

Precautions need to be taken, based on a correct understanding of the Chuetsu-Oki Earthquake, bearing in mind that under certain conditions it might be necessary to abandon plans to restart KK.

A key element in this judgment is determining the design-basis earthquake ground motion (Ss). Ss is described in the September 2006 "Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities" (Guidelines) as "the ground motion to be established as the basis of the seismic design". It is determined as a ground motion that might occur, but very rarely during the operational life of the plant. Nuclear power plants must be designed so that such an earthquake ground motion would not give rise to "any risk of serious radiobiological exposure to the public". This means that the plant must retain its "seismic integrity" (i.e. remain basically in tact) when subjected to such an earthquake ground motion. However, it needs to be remembered that there is no guarantee that Ss will never be exceeded. The Guidelines recognize that there is a "residual risk" that a stronger earthquake ground motion could occur.

Design-basis earthquake ground motion Ss is determined for the following two cases:

1. Site specific earthquakes whose source is identified through surveys of active faults in the vicinity of the plant;
2. Earthquakes whose source is not identified.

One question that arises is, how long is the so-called F-B submarine active fault, which is believed to have caused the Chuetsu-Oki Earthquake. TEPCO and pro-nuclear academics claim that F-B is 27 kilometers long and that it is the fault that should be given most consideration. There are also three active land faults, the Kakuda-Yahiko fault (54 km), the Kihinomiya fault (22 km) and the Katakai fault (16 km). To be on the safe side, TEPCO assessed the case where these all move together as the Nagaoka plane western boundary fault zone (91 km). On May 22, TEPCO submitted an estimate for Ss seismic movement of 2,280 Gal to the central government's investigation committee. This was based on a magnitude 7.0 earthquake arising from F-B, which was conservatively taken to be 34 km long, and a M8.1 earthquake from the Nagaoka plane faults.

From the very beginning there were people in the Niigata Prefecture committee considering the earthquake and the ground condition who believed that the F-B fault was longer than 27 km. According to this view, which was elaborated scientifically at the July 14 meeting, F-B is part of the southern end of the Eastern boundary fault of Sado Basin. The whole fault extends north for up to 70 km and could give rise to a M7.5 earthquake. It cannot be claimed that the Chuetsu-Oki Earthquake has been properly explained, unless there is a consistent explanation of the steep-sloped elevated marine terrace that extends from south to north along the eastern boundary of the basin, the uplift and subsidence of the KK site, and the crustal deformation. It was pointed out that as long as these things remain unclear, it is too soon to discuss the design-basis earthquake ground motion. (See the map on page 9, which is taken from a Japanese leaflet published by Niigata Prefecture on 3 July 2008. The dark area is the land - Sado Island (top left) and Honshu (right). The faults mentioned in this article can be identified by their length.)

Consideration of Ss for unidentified earthquakes (case 2 above) has not even begun. Presumably that is because TEPCO is not yet in a position to calculate the design-basis earthquake ground motion for this. Basically, TEPCO is just waiting to see when the public will be ready to accept the restart of the reactors.

2) Equipment Integrity & Seismic Safety

The earthquake ground motion at Unit 7 (ABWR 1,356 MW) was the lowest of all the KK reactors. TEPCO submitted an interim report on its assessment of the condition of Unit 7's equipment to the Nuclear Industrial and Safety Agency (NISA) in April. At the beginning of July, TEPCO announced that there was no decisive damage to machinery or

equipment at any of KK's seven units. It has begun work to reinforce all seven units to upgrade them from the original design basis of 167~274 Gal (the original design basis for each unit was different) to enable them to withstand an earthquake ground motion of 1,000 Gal.

However, questions regarding the soundness of the plant remain unresolved. Opinions are divided.

TEPCO says that, besides visual inspections, it carried out computer calculations of the stress incurred by pipes, equipment and so on. It claims that comparison of this stress with the allowed stress shows that the stress incurred was not enough to reduce function or strength and that permanent deformation did not occur.

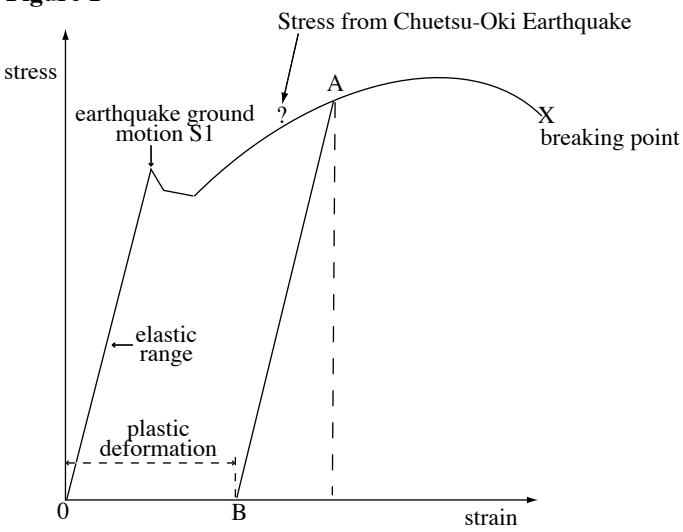
Those who counsel caution point out that TEPCO did not check all locations. There are places which cannot be checked, because of the high levels of radiation. Also, it is not possible to check for "plastic deformation" with computer calculations alone. It is necessary to cut out the portion in question and carry out metallurgical tests. If there is any "plastic deformation" which has not been found, there is a danger that the plant will not be able to withstand the next earthquake.

Allow me to explain the concepts of "allowed stress" and "deformation" in more detail. The behavior of steel when stress is applied is commonly represented as shown in Figure 1. The horizontal axis shows strain, while the vertical axis shows stress. When the stress applied is small, strain is directly proportional to the stress applied. The deformation in this region is said to be "elastic". When the stress is released, the strain returns to zero and no deformation remains. Even if the stress is repeated, for example when the material is shaken by an earthquake, the material returns to its original shape.

Under the previous guidelines, an earthquake ground motion "S1" was determined on the basis that the stress incurred under such conditions would not exceed the range of "elastic deformation". If this limit is exceeded and deformation extends to point A, the material does not return to its original shape, even when the stress is removed. The amount of deformation that remains is shown by 0-B. The deformation is no longer "elastic", it is said to be "plastic". If more stress is applied, eventually the material will proceed to breaking point X. We are very concerned that the stress incurred by KK's pipes and equipment during the Chuetsu-Oki Earthquake was sufficient to cause "plastic deformation".

The truth is that nobody knows how much stress was incurred. Damage and distortion were checked visually, but to get more precise results,

Figure 1



metallurgical tests are necessary. However, as mentioned above, such tests require that the part be cut out. Because this is impractical, TEPCO used computer calculations to assess how much stress was incurred, based on estimates of the seismic force. But these are just calculations. It is impossible to escape the limitations of the data input and of the computer program itself.

Independent calculations were carried out by Japan Nuclear Energy Safety Organization (JNES) to cross-check TEPCO's results and several of JNES's figures turned out to conflict with TEPCO's. Also, the location of maximum stress was different in some cases. For example, for one location in the residual heat removal pipes the stress calculated by TEPCO was 199 MPa, well within the 274 MPa allowed. However, JNES calculated the stress to be 239 MPa, which was much closer to the allowed limit.

At a recent meeting of the Niigata Prefecture committee considering equipment integrity and seismic safety, one of the members who counsels prudence pointed out that using TEPCO's method (hardness tests) it is impossible to determine whether 1~2% plastic deformation remained. TEPCO's representative responded, "We don't take the view that the existence of plastic deformation is a great problem. Even if there is a strain of 8%, the basic properties of the material do not change." But is this really true? It cannot be denied that flaws which are tiny today might develop into large flaws tomorrow.

While the debate about equipment integrity rages on, consideration of seismic safety has not even begun. TEPCO is in a rush to restart the plant, beginning with Unit 7 early in 2009, but clearly any thoughts of restarting the plant are premature.

By Yukio Yamaguchi (CNIC Co-Director)

Rokkasho Reprocessing Plant: Vitrification Problems Continue

No indication when active tests will be completed

Problems continue to plague the high active radioactive waste vitrification facility at Japan Nuclear Fuel Ltd's (JNFL) Rokkasho Reprocessing Plant. Sixty glass canisters were produced in just under two months after vitrification tests began in November 2007, but in the latter half of these tests, JNFL experienced difficulties controlling the temperature of the glass melting furnace and the tests had to be stopped. Tests resumed on July 2 this year, after being suspended for six months, but within half a day, without a single canister being produced, equipment problems arose and the facility had to be shut down once again. Stable production of glass canisters is a condition of government acceptance that active testing has been successfully completed. If JNFL is unable to demonstrate stable production of glass canisters, the whole reprocessing enterprise, including acceptance of the active tests and approval of full commercial operation of the plant, will have to be reconsidered.

The designs for the main processes used in the Rokkasho Reprocessing Plant were imported from the reprocessing plant in La Hague, France. However, the design of the vitrification equipment was developed at Japan's own Tokai Reprocessing Facility. The basic concept for making glass canisters is the same. It involves heating glass until it melts, mixing it with high active liquid waste, then cooling it until it vitrifies.

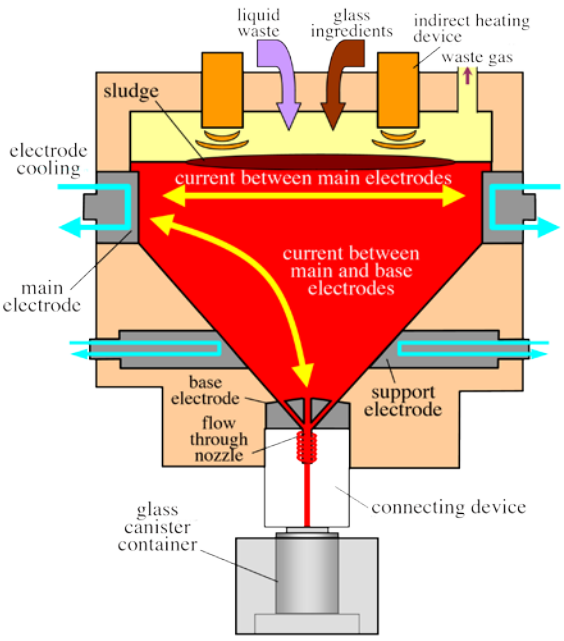
The method used in France, known as "Atelier vitrification de Marcoule" (AVM), involves a two-stage process, using a furnace and a melter. After water and nitric acid in the liquid waste have been evaporated off in the furnace, the waste and the glass are heated together and melted in a melter made of Inconel metal alloy. In the AVM method the life of the melter is around 6 months to a year, meaning that it has to be replaced frequently. Also, due to the fact that it uses induction heating, there is a limit to the extent to which it can be scaled-up.

The method used at Tokai is called "Liquid Fed Ceramic Melter" (LFCM). The melting furnace developed at the Tokai Vitrification Facility (TVF) is made of a fire-proof ceramic material within a metal casing (see diagram). An alternating current, which passes between electrodes fitted into the body of the melting furnace, Joule heats the glass and maintains the temperature at about 1,200ºC. In the LFCM method, high active liquid waste and glass ingredients are put directly into the melting furnace, where evaporation of water and nitric acid and melting of the glass occur at the same time.

The reasons given for adopting the Tokai LFCM method at Rokkasho were that it was easy to scale-up, the life of the melting furnace was longer than in the AVM method (about 5 years) and the quantity of radioactive material produced was small. The melting furnace at Rokkasho is 3m x 3m x 3m, five times larger than TVF. However, there were lots of problems with TVF. Difficulties controlling the temperature meant that platinum group elements (palladium, ruthenium, etc.) in the highly active liquid waste accumulated in the melting furnace, blocking the outlet so that the molten glass could not flow freely down into the stainless steel containers where the glass canisters were formed. These structural problems were inherited by the Rokkasho vitrification facility.

The reason why the vitrification tests at Rokkasho were stopped was that the temperature of the melting furnace could not be maintained at 1,200ºC. Platinum group elements accumulated at the bottom, causing it to take three times longer than normal for the molten glass to flow down. Two months after the tests were suspended, JNFL submitted a report about the causes of the problem and the measures it had taken in response. JNFL wanted to restart the tests, but the Nuclear, Industrial and Safety Agency ruled that the report was inadequate. It said, "no details are provided about the method of stable operation". JNFL finally provided the requested details in June, six months after the tests were suspended.

The fact is that LFCM's problems with platinum group elements have still not been solved. In the first place, contrary to the claims of JNFL and the government, it is impossible to mix all the high active liquid waste into the glass matrix. Evidently it is difficult to mix platinum group elements into the glass matrix. At both Tokai and Rokkasho they tried to prevent platinum group elements from



High Active Liquid Waste Vitrification Equipment Outline (Glass Melting Furnace)

sedimenting out by reducing the temperature at the bottom of the melting furnace to below the temperature at the top, thus making the glass more viscous. However, they were unable to control the temperature and the outlet kept getting blocked.

Measures responding to sedimentation of platinum group elements and conditions for stable operation announced by JNFL are as follows:

1) adjust the concentration and composition of waste liquid by mixing it with other waste liquid;
2) when signs of sedimentation appear, stop adding radioactive waste liquid and just add glass ingredients instead ("cleaning operation");
3) if that doesn't work, stir with a mixing rod;
4) when all else fails, remove all the waste liquid from the melting furnace.

JNFL's "stable operation" method is not so much a method to overcome the problem of platinum group elements, as an ad hoc survival response.

Having obtained the government's approval for this "stable operation" method, at 12:00 midday on July 2 JNFL recommenced testing of the vitrification facility. When the melting furnace reached 1,200ºC, JNFL poured in high active liquid waste. At 21:11 it checked the flow-through of the glass-waste mixture, but the flow stopped immediately. Thinking that the temperature was probably not high enough, JNFL temporarily stopped trying to make the mixture flow through. It raised the setting of the electric heater and restarted the operation, but the molten glass mixture would not flow through. At 23:11 an alarm went off activating an interlock and the test ended in failure.

According to JNFL, temperature control was not the problem, but it was possible that the temperature of the flow-through nozzle that connects the melting furnace to the steel container did not rise, causing the glass to harden. A camera was inserted to check the nozzle and glass-like material was found around the nozzle. JNFL says that in order to find the cause of the problem it will take off the connecting device (about 40cm wide by 1m long) and carry out investigations. However, apparently this flow-through nozzle has not caused problems in the past, so this is a new problem.

There are still eleven batches of molten glass mixture containing one batch of high active liquid waste in the melting furnace. The temperature has been reduced by a few hundred degrees from 1,200ºC and is being maintained at this lower temperature, but it is unclear how long this situation will continue. The issue of safety assurance is a big problem. Apparently, just a few hundred grams of molten glass found its way into the glass canister container.

It is certain that at the end of July an announcement will be made that the date for completion of construction and testing of the plant has been postponed for the thirteenth time. The truth is that no one knows when the plant will be completed.

By Masako Sawai (CNIC)

Corrections to NIT 124

Page 2, Fig 1: Reference for Watanabe *et al* is as follows: Watanabe Mitsuhisa, Suzuki Yasuhiro, Nakata Takashi: *Programme and Abstracts*, Japan Association for Quaternary Research, No. 37, Suppl., 4(2007).
"Fig 2" refers to Fig. 2 printed in NIT 123.

Page 8, para 4: The figures for maximum (= peak) power output were incorrect. The first reference should read as follows: "TEPCO predicted that peak power output would reach 64.71 GW by 2015." Other figures should be corrected as follows: 61.19 GW, 62.36 GW, 31.06 GW, 30.51 GW, 30.83 GW.

Page 10, para 4: Two figures related to volume and depth were incorrect. They should read as follows: “About 130 cubic meters of warm water … by 10 meters deep.”

Nagao versus TEPCO: Unjust Verdict

Case reveals the true nature of companies that exist to fulfill state policy

Mitsuaki Nagao was exposed to radiation as a result of his work at nuclear power plants. He contracted a form of bone marrow cancer known as multiple myeloma and became the first person in Japan to be awarded worker's compensation for a radiation-related illness other than leukemia (NIT No.99, March/ April 2004).

Over a period of four years and three months (October 1977 to January 1982), while working on piping and as a work supervisor at nuclear power plants, including Tokyo Electric Power Company's (TEPCO) Fukushima I plant, Nagao received an accumulated radiation exposure of 70 milli-sieverts. Changes in his physical condition appeared after he retired in 1992, and in 1998 he was diagnosed as having multiple myeloma.

After that, Nagao came to think that his condition was caused by his exposure to radiation. He found supporters and applied for worker's compensation. The Ministry of Health, Labor and Welfare responded by establishing an expert committee to investigate the link between radiation exposure and multiple myeloma. In January 2004 the Tomioka Labor Standards Office (Fukushima Prefecture) concluded that radiation exposure while working at nuclear power plants was indeed the cause of Nagao's condition and awarded him worker's compensation.

Before he was awarded worker's compensation, Nagao joined the Yokohama City Union, a labor union that will accept individual members. (Most Japanese unions are company-based.) He demanded that his direct employer, Ishikawajima Plant Construction Co. Ltd., and prime contractor, Toshiba, publish information about radiation exposure in the places where he worked, but they said they didn't have this information. After being awarded worker's compensation, he demanded that both companies pay damages, but they refused to negotiate with him on the grounds that he had retired from Ishikawajima and that he was not an employee of Toshiba.

Nagao concluded that TEPCO was obliged to compensate him under the Law on Compensation for Nuclear Damage (Nuclear Damage Law), but

Mitsuaki Nagao (left) chatting with his lawyer after giving evidence in court (6 April 2006)

TEPCO rejected his demand out of hand. Since the company refused to negotiate in good faith, he was left with no alternative but to take the matter to court. His supporters established the "Mitsuaki Nagao Support Group for the Nagao versus TEPCO Nuclear Compensation Suit" and in October 2004 he sued TEPCO under the Nuclear Damage Law.

Unjust Verdict Rejects Multiple Myeloma Diagnosis

On 23 May 2008, the Tokyo District Court rejected Nagao's case on all counts. Judge Hidetaka Matsui rejected the diagnosis itself, saying that Nagao did not suffer from multiple myeloma at all. He went on to say that even if Nagao's condition was multiple myeloma, there were too few cases to draw a cause-effect relationship with radiation exposure.

The verdict showed clearly how the judicial system shows bias towards the nuclear industry, because of its "national policy" status, even giving it a higher priority than human health and life. One is forced to ask the question, is the judiciary really independent in Japan?

Background of the Case

Under the Nuclear Liability Law, nuclear power companies are held responsible regardless of fault, so TEPCO's negligence was not an issue. Since the Ministry of Health, Labor and Welfare had already accepted the cause-effect relationship between

radiation exposure and multiple myeloma, it was presumed that the key issue would be the amount of compensation to be paid.

However, the defendant, TEPCO, chose to fight on all fronts. It stopped at nothing, no matter how ugly, to avoid paying compensation. Its main three arguments were as follows: 1) there is no cause-effect relationship between radiation exposure and multiple myeloma; 2) even if a relationship exists, the period during which Nagao was entitled to claim has elapsed; 3) Nagao's condition is not multiple myeloma.

Over half of the three-year trial was taken up by consideration of four submissions presented by TEPCO. These submissions, which claimed that Nagao's condition was not multiple myeloma, were written for TEPCO by multiple myeloma specialist Dr Kazuyuki Shimizu, a professor at Nagoya University Graduate School of Medicine.

Dr Shimizu's submissions were a mass of distortions. They used multiple diagnostic standards arbitrarily, distorted Nagao's medical history by selective quoting and were inconsistent with each other and with his own published articles. According to Dr Shimizu, Nagao suffered from "solitary plasmacytoma", as well as from "monoclonal gammopathy of undermined significance", even though the symptoms of these conditions are clearly inconsistent with Nagao's symptoms. Nagao's supporters took on the challenge of studying these complex technical documents and pointing out the inconsistencies and distortions in Dr Shimizu's submissions.

Hearings finally ended on 7 December 2007. On that day, Mitsuaki Nagao submitted a final statement to the court which said, "I am too sick to express my views in person before the court, but I appeal to the judge to hand down a decision which sheds light on the darkness of Japan's nuclear power industry." Thereafter his condition deteriorated rapidly and on December 13 he passed away at the age of 82.

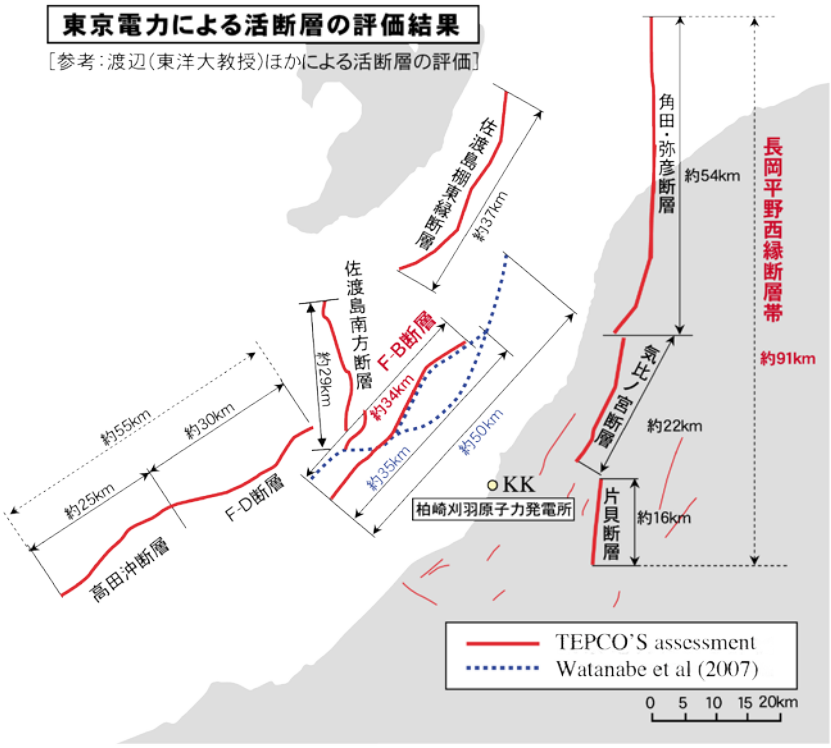
At the wish of Nagao's family, on June 5 his support group appealed to the Tokyo High Court.

In April 2006, responding to questions in court, Nagao had described in detail the terrible conditions of nuclear workers. One sensed his deep concern for the current generation of workers, who work in fear and anxiety. After winning his worker's compensation case, Nagao said, "Many nuclear workers are exposed to radiation. Acceptance of my worker's compensation case, for a condition that arose many years after I had finished working, will give encouragement to other workers. I want to help other workers while I am still healthy enough to do so."

Despite suffering from his disease, Mitsuaki Nagao fought for justice to the very end. We would like to carry on the battle for him.

Mikiko Watanabe (CNIC)

Map of faults near Kashiwazaki-Kariwa NPP (refer page 4)



Haiku for the season

A whisper of wind
through the bamboo grove
a sigh of summer?

When I went to school, I had to go up about three hundred stone steps, near which I had to pass by a bamboo grove. I heard a sound of a summer wind blowing through the grove. I felt a sigh of summer.

Haiku and comment by Masao Amano

Major Incidents at Nuclear Facilities April 2007- March 2008

Date	Facility Name	Incident Description	Cause, Response, Etc.
5 April 07	NFI Tokai	18 kg of uranium powder was carried in a powder handling box in the pellet fabrication room in the uranium fuel fabrication facility. This exceeds the box's 15 kg nuclear limit. The limit was exceeded on 3 occasions.	An interlock will be installed to prevent the limit being exceeded.
10 May 07	Sendai-1	Deterioration was found in 13 heat transfer tubes in the steam generators (4 pipes in SG A, 2 in SG B and 7 in SG C).	Stress Corrosion Cracking (SCC) of Inconel 600 alloy was found on the inside surface of the tubesheet expansion portion in the primary coolant inlet side. The damaged pipes will be plugged at the tubesheet and not used.
22 May 07	Onagawa-1	Under adjustment operation, during a manual start-up test of the high-pressure coolant injection pump, flow rate at the outlet side was too low. The situation did not improve when a regulating valve was adjusted, so the reactor was shut down manually.	The valve stem and parallel pin were broken due to fatigue caused by cavitation within the valve.
8 June 07	Fuku II-2	When conducting blast work for recoating of the suppression pool wall, metal powder used for intensive blasting hit a small area of the wall due to incorrect operation. Part of the wall was eroded to less than the required thickness.	Due to the poor work environment, communication between the workers was insufficient. The damaged section will be built up by overlay welding.
19 June 07	Fuku I-1	During periodic inspection of emergency diesel generator 1A, smoke was emitted from the generator and its power panel.	Excess current flowed through the part, because part of the circuit breaker components had been assembled in reverse due to an assembling error.
5 July 07	Hamaoka-5	During adjustment operation, an alarm indicated inoperability of reactor average power monitor-B. At the same time, one of the signals showing rapid reduction of reactor coolant flow rate was also excluded. Power output was reduced to less than 75%.	A component in the central processing unit (CPU) used to measure reactor power was damaged. Replacement parts fitted.
16 July 07	KK-3	Fire in transformer 2B.	Consequence of the Chuetsu-Oki Earthquake
16 July 07	KK-6	Water containing about 90,000 Bq of radioactive material, which leaked from the contolled area to the uncontrolled area, was discharged to sea.	Consequence of the Chuetsu-Oki Earthquake
24 July 07	KK-6	Cross pins used at the drive axis universal joint of the overhead crane were damaged in three locations.	Consequence of the Chuetsu-Oki Earthquake
3 Sep. 07	Ohi-1	The water level fell in the pressurizer and in the chemical and volume control tank. A leak was discovered around the primary coolant pump seal water injection filters. The reactor was shut down manually.	The O-ring on the filter flange was broken.
18 Sep. 07	Tomari-1	Emergency diesel generator 1B shut down automatically during a start-up test. Safety rules required that emergency diesel generator 1A also be tested. When 1A was tested again the following day, it failed to start. The reactor was shut down manually.	Foreign material was found inside the governors. The governor for 1A had only just been replaced in August.
25 Sep. 07	Mihama-2	During a periodic inspection, cracks were found on the inside of the primary coolant inlet piping nozzle stub of steam generator A.	Stress Corrosion Cracking (SCC) of Inconel 600 alloy. The safe end and elbow will be replaced. Repairs will use Inconel 690 alloy.
1 Oct. 07	Rokkasho Reprocessing Plant	During active tests, while spent fuel was being sheared, the basket in the end-piece cleaning tank stopped operating. On Oct. 5 it was confirmed that the basket was deformed and that the end-piece had fallen to the bottom.	The sensor that detects whether the endpiece has been transferred to the next process was not adjustable.

Major Incidents at Nuclear Facilities April 2007- March 2008 Continued

2 Oct. 07	Takahama-2	During a periodic inspection, while testing extraction and insertion of the control rods, the control rod position indication system showed one rod near the full withdrawn position, when all rods should have been fully inserted.	Foreign material appeared to have fallen between the control rod cluster guide tube and the control rod, preventing it from moving into place.
18 Oct. 07	Tsuruga-2	During a periodic inspection, cracks were found on the inside of the primary coolant inlet piping nozzle stubs of steam generators A, B & C.	SCC of Inconel 600 alloy. Inconel 690 alloy weld will be applied after machining the damaged section.
7 Nov. 07	Ohi-2	During a periodic inspection, pipe thinning was discovered in the elbow section downstream of the main feedwater isolation valve in main feedwater pipe C (carbon steel). In places the pipe was below the minimum allowed thickness.	Thinning due to erosion and corrosion of the carbon steel pipe.
10 Nov. 07	Onagawa-3	During adjustment operation, the reactor was shutdown manually in response to an alarm in the off-gas treatment system indicating “Off-Gas Dehumidification Cooler outlet Hydrogen concentration high”.	A simulation test showed that the reaction between hydrogen and oxygen slows down rapidly when the oxygen/hydrogen ratio drops below a certain threshold. The lower the reactor power, the higher the threshold tends to be.
15 Nov. 07	Hamaoka-4	During adjustment operation, the reactor was shutdown manually in response to a large CUW differential flow alert in the reactor coolant cleanup system. Operators confirmed abnormal noise in the regenerated heat exchanger room.	According to Chubu Electric, the setting for detection of large CUW (reactor cleanup water system) differential flow was incorrect.
21 Nov. 07	Shimane-1	While the refueling machine was being moved from the spent fuel pool to above the reactor core for inspection, the refueling machine's fuel gripper was deformed when it came into contact with the railing of the spent fuel pool.	The operator failed to check the surrounding area,.
27 Nov. 07	Hamaoka-1&2	During a periodic inspection, cracks were found in the pass-through section of a common exhaust stack of Unit 1 and 2 (specifically, the sampling pipe designed for monitoring purposes) .	A tube will be installed to surround the pass-through section and the pass-through section of the sampling pipe at the stack monitor will be included in the inspection plan of the exhaust stack.
4 Dec. 07	Takahama-2	During a periodic inspection, cracks were found on the inside of the primary coolant inlet piping nozzle stubs of steam generators A, B & C.	SCC of Inconel 600 alloy. Inconel 690 alloy weld will be applied after machining the damaged section.
18 Dec. 07	Genkai-1*	During a periodic inspection, cracks were found on the inside of the primary coolant inlet piping nozzle stub of steam generator A.	SCC of Inconel 600 alloy. The damaged section will be removed by machining.
4 Feb. 08	Takahama-3	During a periodic inspection, cracks were found on the inside of the primary coolant inlet piping nozzle stubs of steam generators A, B & C.	SCC of Inconel 600 alloy. Inconel 690 alloy weld will be applied after machining the damaged section.
12 Mar. 08	Ohi-2	During a control rod operation test, one of the four rods constituting the D bank was found to be out of position. Power output was reduced to 75%.	According to Kansai Electric, crud in the primary coolant had seeped into the sliding section within the control rod drivers.
17 Mar. 08	Hamaoka-1	During a periodic inspection, it was discovered that corrosion had occurred on the external surface of the condensate tank (installed outdoors) and that the tank wall failed to satisfy the technically required thickness at 3 points.	Apply build-up welding. Chubu Electric said it would include this in its periodic inspection plans.

* Reporting not legally required. In all other cases listed reporting was required under the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.

K-K = Kashiwazaki-Kariwa; Fuku = Fukushima; NFI = Nuclear Fuel Industries Ltd.

Anti-Nuke Who's Who

Takashi Yamato: Fighting the Planned Kaminoseki Nuclear Power Plant

by Tomiko Takeshige*

It is planned that a nuclear power plant will be constructed in the middle of the Seto Inland Sea National Park. Takashi Yamato (30) lives on the island of Iwaishima, 3.6 km off the coast from the proposed site.

Takashi's father, Sadao Yamato, is at the center of the movement against the nuclear power plant. He is a former leader of the Iwaishima fishing cooperative. Perhaps it was because Takashi grew up watching his father giving everything he had to this bitter 26-year-long struggle, but eight years ago, after graduating from university, he returned home from Osaka. He took up farming the orchard of his ancestors, found a partner who shares his ideals and became a key person in the struggle against the nuclear power plant.

Thanks to the Kuroshio Current from the Bungo Channel, the 580 inhabitants of Iwaishima are able to get by perfectly well on the island's abundant seafood and agricultural produce. They don't need a nuclear power plant. Especially in June, the branches of the organically grown loquat trees which cover the mountains are laden with big sweet fruit. The loquat leaves are used to make a healthy herb tea. They say it keeps the doctor away.

Because of the warm climate, sweet potatoes, Chinese radish (which is cut into strips and dried) and hijiki seaweed in early spring all come earlier than on the mainland. Takashi markets these, along with the fishing cooperative's seafood, on a web site that he set up himself. His web site doesn't just cover the island's produce and the campaign against the nuclear power plant. It also promotes local events and attractions, serving as a medium of exchange between the island and the outside world.

As part of last year's campaign, Takashi stood as a candidate in the mayoral election. Having been domesticated for 25 years by Chugoku Electric Power Company, 60% of the residents of Kaminoseki Town have become spungers. Takashi called for reform and independence in a

town where politics is smeared with money and vested interest. Unfortunately, he was not elected. However, he did not lose his strong determination. He continues to bring in other people who have returned to the island and share ideas with them. He perseveres under the motto "let's become a first rate country town".

On June 17 this year, Chugoku Electric submitted an application to Yamaguchi Prefecture for permission to reclaim public sea area with 140,000 m^3 of landfill. If there are no inconsistencies in the documents, the governor is expected to give his permission soon. For Iwaishima this is a life or death issue. Even though the Iwaishima fishermen have not sold their fishing rights, their fisheries will be destroyed. The reputation of the island's seafood and agricultural produce will be damaged and they will be unable to sell them. The number of city people coming for holidays will fall. This is the future that they see before them.

The area that will be reclaimed is internationally acclaimed for its biodiversity. For us to find a way to fight the monster of "government policy" and protect this precious area, we will need strong leadership from our brave young warrior, Takashi Yamato.

**Tomiko Takeshige represents the No Nuke Yamaguchi Network.*

NEWS WATCH

Under-age workers employed in radiation-related work

A Toshiba sub-sub contractor deliberately misreported the age of nine under-age (under 18) temporary workers and submitted forged identification papers to obtain radiation control hand books for them. It was discovered in May that seven of the workers worked in radiation control areas at Tokyo Electric's Fukushima I and Tohoku Electric's Onagawa and Higashidoori nuclear power plants from October 2007 to May 2008. Toshiba reported the incident to the Labor Standard Inspection Office in May. Perhaps because of the media reports on June 4, the Nuclear Industrial and Safety Agency (NISA) reprimanded Toshiba on June 5 and demanded that it take prevention measures. NISA also demanded all nuclear power and fuel cycle companies to check whether there had been any cases at their facilities of forged identification documents and misreported age.

Each company reported to NISA on June 18, but on June 24 NISA announced that some companies had simply relayed the results of surveys carried out by their subcontractors without checking them. NISA said that this was "very regrettable" and demanded that the companies themselves check original identification with photos, such as drivers' licenses or passports.

There had been a previous case in 1988, where three high school students used other people's resident certificates to obtain radiation control hand books to enable them to work at Kansai Electric Power Company's Takahama nuclear power plant.

Japan-Kazakhstan Joint Statement

On June 20, Prime Minster Yasuo Fukuda and Kazakhstan President Nursultan Nazarbayev issued a joint statement on nuclear cooperation. Tokyo Electric - Marubeni and Kansai Electric - Sumitomo are participating in projects to develop uranium mines in Kazakhstan. Other nuclear business ventures (see below) are also planned. The leaders of the two countries agreed to make efforts for the early conclusion of an agreement for cooperation in the nuclear energy sector.

On the same day, Toshiba signed a memorandum of understanding (MoU) with Kazakhstan's national atomic company, Kazatomprom, on strengthening cooperation in the field of nuclear energy. The MoU was aimed at strengthening future business development. It covered cooperation in the fuel supply chain (development of uranium mines, uranium enrichment and fuel fabrication), nuclear component manufacture, and the application of Kazakhstan's beryllium and tantalum resources in nuclear power plants.

On June 3, a uranium mine being developed by Kansai Electric, Sumitomo and Kazatomprom was opened. Then on June 9 in Kazakhstan's capital, Astana, Japan Atomic Energy Agency and Kazakhstan Atomic Energy Committee signed a memorandum of understanding to make efforts for the conclusion of an agreement on high-temperature gas-cooled reactor safety research. Kazakhstan has announced plans to introduce large-scale light water reactors (1000 MW class), medium-size light water reactors (300 MW class), and small reactors (50 MW class) for cogeneration of heat and electricity for regional towns. High-temperature gas-cooled reactors are said to be the most likely small reactor candidates.

Cameco Invests in GLE

On June 20, GE-Hitachi Nuclear Energy announced that Canada's largest uranium producer, Cameco, would invest in its subsidiary company GE-Hitachi Global Laser Enrichment (GLE). GLE is developing laser uranium enrichment technology with a view to commercialization. GE will own 51% of GLE, Hitachi will own 25% and Cameco will own 24%.

Japan-US Joint Statement on Nuclear Cooperation

On June 7, Japanese Minister for Economy, Trade and Industry, Akira Amari, and US Energy

Secretary, Samuel Bodman, issued a joint statement on nuclear cooperation. Meeting prior to the G8 Energy Ministerial Meeting held in Aomori City on June 7~8, they confirmed progress in several areas of cooperation, including the following:

"*The expression of the intention to consult on potential financing support measures that would facilitate nuclear power plant construction in the United States of America, incorporating the financial institutions identified by METI (Japan Bank for International Cooperation (JBIC) as well as Nippon Export and Investment Insurance (NEXI)), and identified by the United States Department of Energy (DOE Loan Guarantee Program Office).*"

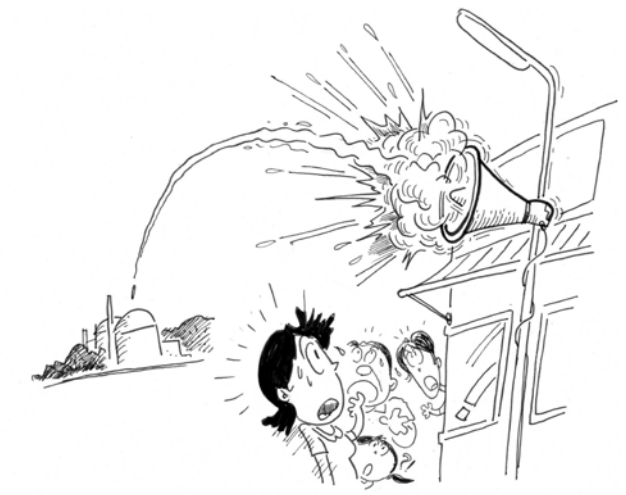
In the past JBIC and NEXI have not provided support for nuclear power related projects in developed countries. The new deal will break this principle. We need to be on our guard against the excuse they give, namely that nuclear power is alleged to be a solution for the problem of global warming.

Missile Warning - False Alarm

Mihama town in Fukui Prefecture is home to Kansai Electric's Mihama Nuclear Power Plant (3 PWRs, total 1,666 MW). On the afternoon of June 30, the following message was broadcast over 58 loud speakers in the town:

"*Missile alert. There is a danger that a missile will land in this area.*"

Council workers who noticed the mistake stopped the broadcast manually. Using the same speakers, along with 3,800 broadcasting machines located in homes and offices in the town, they announced that the warning was a false alarm, but in the meantime the council's phones rang hot as frantic residents called in to find out what was going on.



Cartoon by Shoji Takagi

The warning was given by the Fire and Disaster Management Agency's satellite-based alert system, J-Alert. In the case of large-scale disasters, or attacks from other countries, information necessary for the protection of citizens is relayed instantly to regional authorities using the Superbird B2 satellite communication system. Also, the local disaster prevention authorities' wireless system, which is connected to the national satellite communication network, is activated automatically and emergency information is relayed to citizens.

On the day of the incident, there was a problem with some of the system's equipment. The Fire and Disaster Management Agency gave directions by email and phone on how to check the equipment. When the system was reactivated, a standardized message, which was only intended for internal use in order to check the system, was accidentally broadcast over the loud speakers.

The false alarm, which came at a time when the whole country was on high-alert status for the G8 Summit in Toyako, Hokkaido, had the salutary effect of reminding the residents of Mihama that the nuclear power plant in their town could be a target of a missile attack.

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. Please write to us for a subscription (Regular subscriber - $30 or ¥3,000/year; supporting subscriber $50 or ¥5,000/year). When paying in Japan, the subscription fee should be remitted from a post office to our post office account No. 00140-3-63145, Genshiryoku Shiryou Jouhoushitsu. Due to costly processing fees on personal checks, when sending the subscription fee from overseas, please send it by international postal money order. Alternatively, you can ask us to send you details regarding bank transfers. We would also appreciate receiving information and newsletters from groups abroad in exchange for this newsletter.
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