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Citizens' Nuclear Information Center

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Can Safety Be Assured in the Monju Modifications?



Protest scene - Monju in the background (Photo by Kiyohiko Yamada)

On 7 February 2005, Fukui Governor Issei Nishikawa granted approval for the start of modifications to the Monju fast breeder reactor (FBR, 280 MW), which had been shut down for over nine years. Upon receiving this approval, the former Japan Nuclear Fuel Cycle Development Institute (JNC) (now JAEA) started work on the modifications. On May 30th, as if all these players were working in collusion, the Supreme Court reversed the Nagoya High Court decision, which had acknowledged the claims of the plaintiff citizens and ruled that the license approval of the facility was invalid¹ (see NIT 107).

The Fukui Governor's approval is reputed to be part of a deal to extend the bullet train line to Fukui Prefecture and to obtain a 1.9 billion yen budget for a planned center for energy research and development in Fukui Prefecture.

It is stated in the AEC's "Framework for Nuclear Energy Policy", that the aims of restarting operations at Monju are "demonstrating reliability as an operational power plant and establishing

sodium handling technology"². The aim is to achieve these goals within approximately 10 years and then make Monju a center for international cooperation. It seems as though any intention to position Monju as a breeder reactor has in fact been abandoned.

It is doubtful that Monju's reliability as a power-generating reactor can be proven, but even if it could be this would be of no use, as there is no future for Monju³.

Furthermore, only one third of the operators who were working at Monju before the accident are still there. Even if the number of staff was increased and the new operators gained experienced, there are no future prospects for them.

Regarding sodium handling technology, prior to Monju first achieving criticality, Power Reactor and Nuclear Fuel Development Corporation (PNC - previous incarnation of JNC) claimed to have already established this technology. The sodium accident in 1995 proved that this was not true. It

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is ironic that they now claim the need to establish sodium handling technology as a reason for restarting Monju.

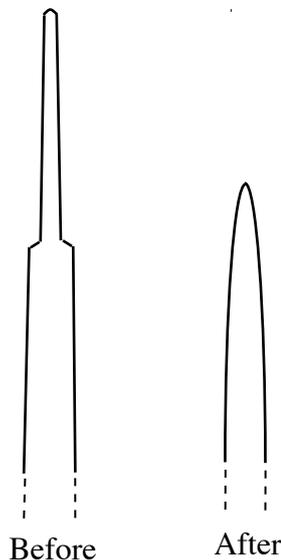
As of 2004, 1.7 trillion yen had been spent on the development of FBR cycle technology. Of this, 810 billion yen was direct investment in Monju. Even while it was inoperable due to the accident, about 10 billion yen was squandered every year on maintenance and management⁴. 18 billion yen is to be spent on the modifications, and 15 billion yen will be spent each year to maintain operation. All this, despite the absolute meaninglessness of these investments.

The first step in the modifications will be the replacement of the thermocouple casing that was the cause of the sodium leak accident ten years ago. The said thermocouple casing ruptured from vibration during the flow of sodium. The section that penetrated the pipe in which the sodium flowed had an angular structure. This section of the new thermocouple has a shorter, smoother shape. The replacement of the thermocouple was to begin on 12 December 2005.

Secondly, measures will be taken to respond to sodium leaks. Specifically, cell monitors will be installed for early leak detection. The drainage system will be modified, including adding drain pipes to shorten the time it would take to extract sodium in the event of an accident. In addition, measures to mitigate the effect of a leakage will include the installation of insulation on walls and

Thermocouple Casing

(schematic diagram of modification of section penetrating the sodium pipe)



ceilings, a nitrogen gas infusion apparatus, and the installation of a comprehensive video monitoring system. While it seems that solid countermeasures are being taken, doubt remains about the efficacy of these measures. For example, while the drain pipes will be changed to large caliber, the opening into the final drain tank will remain at its original size. On the other hand, if this opening were to be changed to large caliber, there would be an increased risk of a rupture in the overflow tank itself due to thermal shock.

In sodium leak testing following the accident, five holes, both large and small, opened in the steel floor liner. PNC did not have knowledge of the chemical reaction (molten salt reaction) at high temperatures between sodium and steel. Nevertheless, additional measures give no consideration to increasing the thickness of the floor liner.

The third step will be measures regarding the steam generator. Specifically, in order to deal with a water-sodium reaction accident caused by a water leak from the steam generator heat transfer tubes, a steam generator cover gas pressure gauge will be installed. Further, additional modifications will be carried out for a release valve to improve the drainage performance of water and steam from inside the heat transfer tubes (blow down). With only one system to communicate pressure, merely adding a cover gas pressure gauge to the steam generator (leaving the heater as is) will be of no use if a breakdown occurs here.

These measures are being taken to counter the high-temperature rupture of heat transfer tubes. This is an issue which JNC kept hidden, as was revealed by the plaintiffs during the court battle. The safety evaluation claims that high-temperature ruptures can be prevented by the additional countermeasures. However, the safety evaluation was based on flimsy evidence, since only twice in the past have experiments been conducted on high-temperature ruptures.

The measures described above are mainly related to sodium, but it cannot be said that these make Monju safer. There are dangers that are inherent to Monju which remain unchanged. These include the danger of a run-away chain reaction and safety problems with the piping. The piping above the reactor is designed to cope with expansion at high temperatures (not fixed and

winding around rather than straight), but this is a weakness in the case of earthquakes. Further, the elapse of ten years has no doubt caused degradation of the sodium and deterioration of machinery and pipes. One wonders to what extent the issue raised by the Monju Safety Assurance Investigative Committee⁵ regarding the "confirmation of the soundness of machines, systems and fuel not used for a long time" will be addressed. It is impossible to check all the machinery, so it is unlikely that the safety assurance demanded by the community will be provided.

Further, a previously unknown active fault was discovered by the Earthquake Research Committee of the Ministry of Education, Culture, Sports, Science and Technology. The Urasoko fault connects with the Yanagaseyama fault on the ocean floor of Tsuruga Bay, with the latter extending to Shiga Prefecture. JNC asserted that while it had not taken this earthquake into account, according to results of calculations it would not be a problem. There is nothing to point to the objectivity of these calculations. Research is being extended to Wakasa Bay, and it is feared that research results could show that an earthquake associated with this fault would exceed the safety specifications. So it cannot be said that the modifications will improve Monju's safety.

A large meeting calling for the shut down of Monju was held on December 10th. It was led by the anti-nuclear power group, Fukui Residents' Committee. CNIC was a sponsoring group. At the meeting, it was confirmed that a monitoring committee of citizens would be established to check on the modifications, while continuing to engage in activities toward the shut down of the reactor.

Hideyuki Ban (CNIC Co-Director)

1. The plaintiffs lodged an appeal for a review of this decision, but their appeal was rejected on 15 December 2005. Judges of the Supreme Court are divided into three groups. Some people have questioned the probity of the fact that the same group of judges which made the original decision also heard the appeal. There are now no further avenues for appeal.

2. Framework for Nuclear Energy Policy, Japan Atomic Energy Commission, October 11, 2005, p.

39

3. On December 26th the Nuclear Power Subcommittee of the Advisory Committee for Natural Resources and Energy began a debate regarding the realization of the nuclear fuel cycle. During the proceedings the Agency of Natural Resources and Energy, which provides the secretariat for the above subcommittee, announced the following: (1) a successor to the Monju prototype FBR would be installed by around 2030; (2) a second reprocessing facility would begin operations around 2045. Neither of these plans is realistic and, significantly, there was no indication that the Monju successor would be upgraded to 'demonstration reactor' status. This suggests that they don't expect to achieve much with Monju. Furthermore, it is unclear who would install a successor to Monju. No one seems eager to take on this responsibility.

4. Monju has continued to consume a large quantity of electricity ever since the accident. Most of the electricity consumed is used to heat the sodium liquid, which remains in the reactor. Details of electricity consumption for 2004 are as follows:

Hokuriku Electric Power Company was contracted to provide 70,127,000 kWh in 2004 at a price of 695,572,563 yen. In fact, the final consumption for that year was only 58,533,960 kWh, but being a fixed price contract, the price did not change.

5. This committee began in November and is part of the Nuclear Industrial and Safety Agency's Nuclear Reactor Safety Subcommittee.

Haiku for the Season

*Persistently
a dead leaf clings to the twig
withstanding the gale*

by Masao Amano

Comment by the author:

Almost all of the leaves fell off the cherry tree in my neighbour's garden. The last few leaves cling to the twigs. Several days later only one last leaf still clings to the twig. I remember O. Henry's short story *The last leaf*. Try hard to cling, the last one!

Foreseeing Japan's nuclear future

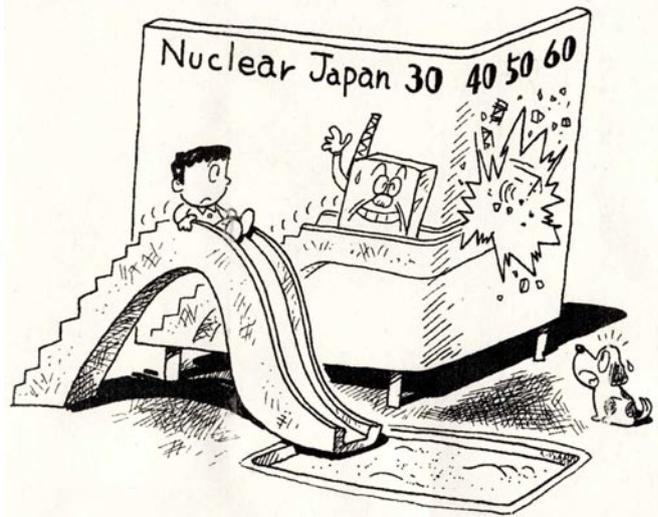
On 8 December 2005, Tohoku Electric Power Company's Higashidori-1 (BWR, 1,100 MW) commenced operations. With this new reactor, there are now 54 nuclear reactors in Japan, together having a total output of approximately 48 GW. In addition, Hokuriku Electric's Shika-2 (ABWR, 1,358MW) is undergoing trial operations, and Hokkaido Electric's Tomari-3 (PWR, 912 MW) and Chugoku Electric's Shimane-3 (ABWR 1373 MW) are under construction. Adding these reactors, the total capacity will come to approximately 52 GW.

Japan is third, after the United States and France, in terms of nuclear power output. Not counting those years in which significant numbers of reactors were shutdown due to accidents and so on, nuclear represent about 35% of the total electricity produced by electric power companies. The Atomic Energy Commission states in its Framework for Nuclear Energy Policy (14 October 2005), "...it is appropriate to aim at maintaining or increasing the current level of nuclear power generation (30 to 40% of the total electricity generation), even after 2030." (p. 29)

The Framework for Nuclear Energy Policy summarizes the direction of Japan's nuclear power policy. In the past, equivalent documents were known as the "Long-term Program for Research, Development and Utilization of Nuclear Energy". There was a controversy over whether the government should get involved in such specific planning and this led to the change of name from "Long-Term Plan" to "Framework". More importantly, among the reference materials attached to the Framework, there is a graph entitled "mid-term direction" (Japanese version only, p. 91), showing a nuclear output of 58 GW continuing from 2030 through to 2100.

Nonetheless, considering that the 1994 "Long-term Plan" predicted that the capacity in 2030 would be 100 GW, the figure in the revised plan is very moderate. The plan involves

Cartoon by Shoji Takagi



replacing old nuclear reactors. Since the output of replacement reactors is expected to be larger than that of existing reactors, the plan must have been drawn up based on the assumption that not every reactor will be replaced. However, even an output of 58 GW is highly unrealistic. More likely, by 2030 many reactors will have been decommissioned without a replacement being built. The net result of this would be a reduction in total capacity. If that happens, it will be impossible to sustain Japan's nuclear power industry and there will be a swift and total phase-out of nuclear power.

As mentioned above, there are now 54 nuclear reactors in Japan. Yet there are only 17 nuclear power plants (NPP), some of which are located close to each other. The construction plans for all of these NPPs were announced before 1970. None of the construction plans announced since 1971 have resulted in actual construction. What this means is that for the nuclear power plants currently in operation in Japan the decision to proceed with construction was made before people knew what nuclear power really was.

The fact is that of all the new NPP plans that have surfaced since nuclear power started operating in Japan and people became aware of the risks involved, not a single one has been built. Higashidori-1 is the first reactor to commence operations at a new NPP in 12 years,

but it took 40 years from the time Higashidoori town council agreed to host an NPP in May 1965.

It should be noted though, that at sites where a nuclear reactor is already operating, resistance to another one being constructed is weak. The subsidy that the government provides for the construction of one nuclear reactor is approximately 20 billion yen. Once it commences operations, the amount of the subsidy becomes minimal and property tax revenue too gradually falls over the years. Even local small and medium enterprises that benefit from peripheral projects associated with the construction of nuclear facilities (only large enterprises can undertake the actual construction) face a sudden fall in revenue once the reactor becomes operational. It is no wonder that some local people wish for the construction of new reactors. There are also people who feel a sense of resignation and say, "Well, there is already one, so what difference does another one make to the danger?"

This is the "secret" as to why so many nuclear power plants have been constructed in Japan. Other reasons include the submissive attitudes towards national decisions, which is more deep-seated in sparsely settled parts of the country. The end result is that there are now 54 nuclear reactors in Japan.

On the other hand, the attitudes of local residents, who in the past were tolerant towards nuclear power, have changed due to repeated exposures of fraudulence by electric power companies and a series of accidents, such as the disastrous nuclear accident at the JCO uranium conversion facility in Tokai Village, Ibaraki Prefecture in September 1999 that resulted in two deaths and neutron radiation exposure to residents in the vicinity of the site, and the pipe rupture at the Mihama-3 reactor in Mihama Town, Fukui Prefecture that killed five people and injured six other people in August 2004.

Provincial governments and municipalities that have long followed national policies are gradually changing their attitudes. Fukushima Prefecture, which has 10 reactors with a total capacity of 9,096MW, has declared that it

will aim for regional development without dependence on nuclear-related funds. It assumes that by 2030 all its reactors will have been decommissioned after more than 40 years of operation. Tokyo Electric Power Company's (TEPCO) position is that its reactors will continue operating for 60 years, hence no reactors will be decommissioned until 2030, but this is unrealistic.

The climate surrounding electric utility business has changed. The partial deregulation of electricity retailing, which began in March 2000, has expanded the scope of liberalization. Total electricity demand has stopped growing. Changes such as these have caused electric power companies to lose interest in constructing new reactors. The new climate even affects the construction of reactors for which construction plans have already been announced. Each year for several years now their construction has been further delayed.

As for the Higashidoori nuclear power plant construction plan, it was originally a large-scale plan envisaging the construction of reactors for TEPCO and Tohoku Electric, with a total capacity of 10GW each. At present, however, plans remain to construct Tohoku Electric's Higashidoori-2 (ABWR; 1,385 MW) and TEPCO's Higashidoori-1 and Higashidoori-2 (ABWR; 1,385 MW each), though these plans have been postponed and there is a persistent rumor that they will be cancelled. Even the electricity generated by Tohoku's Higashidoori-1, which has just began operation, is not accompanied by a sufficient increase in demand. Hence it can only be operated if TEPCO accepts the large excess. Effectively it is a joint reactor. On the other hand, these two companies are now direct competitors in the liberalized electric utility business. Operating simultaneously as partners and competitors, it seems that they have a rocky road ahead of them.

Baku Nishio (CNIC Co-Director)

Nuclear Plants in East Asia

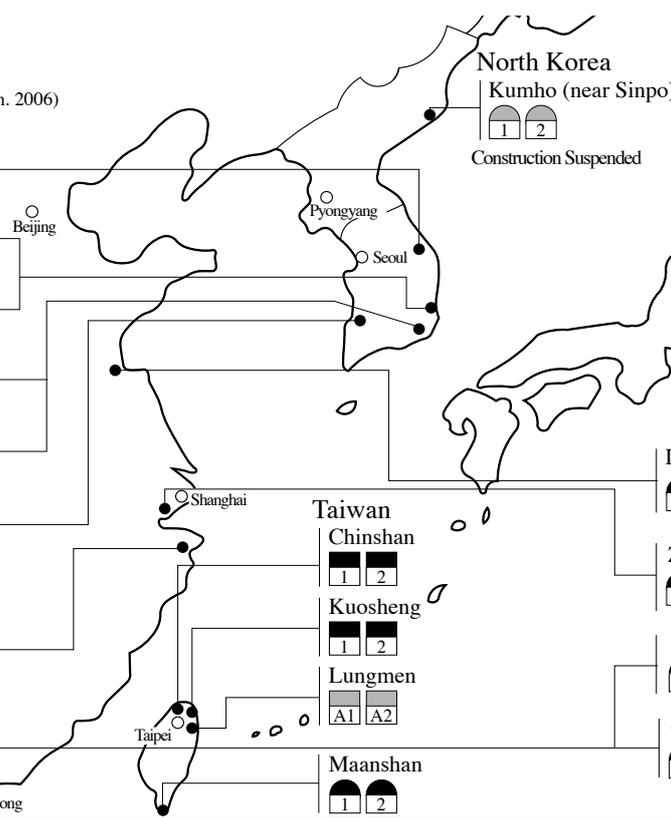
(as at Jan. 2006)

South Korea

- Ulchin
1 2 3 4 5 6
- Wolsong
1 2 3 4
- Shin-Wolsong
1 2
- Kori
1 2 3 4
- Shin-Kori
1 2 A3 A4
- Yonggwang
1 2 3 4 5 6

China

- Zhejiang Province, Sanmen
1 2
- Guangdong Province, Yangjiang
1 2



Type of Reactor

PWR
 APWR
 BWR
 ABWR
 CANDU

Status

..... Operable
 Under Construction
 Planned

China

- Liangyungang Province, Tianwan
1 2
- Zhejiang Province, Qinshan
1 2 3 4 5 6
- Guangdong Province, Daya Bay
1 2
- Guangdong Province, Lingao
1 2 3 4

© CNIC

map B Commercial and Research Nuclear Facilities in Japan

(as of Jan. 2006)

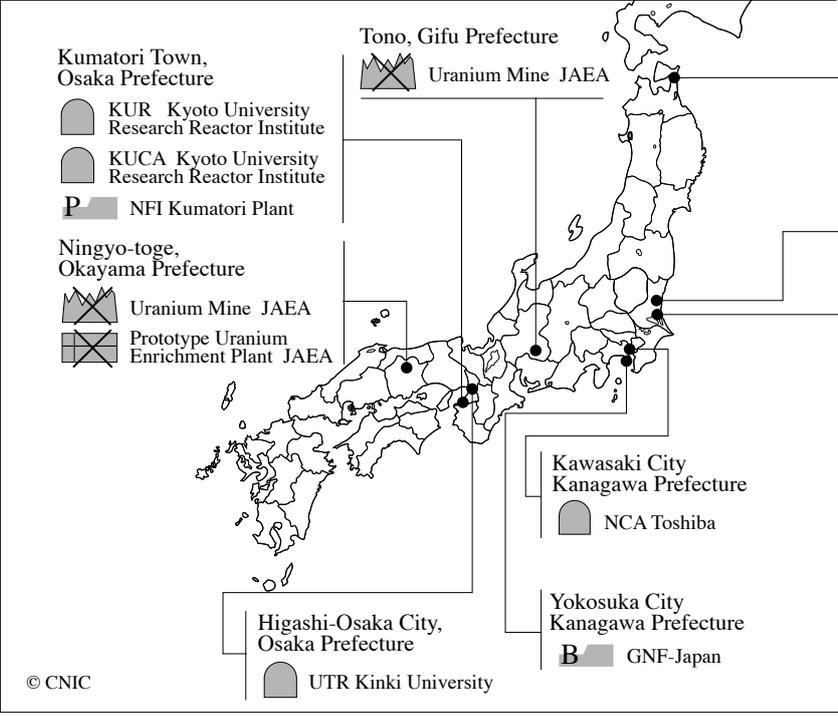
Type of Facility

- Research reactor (CA=Critical Assembly)
- Uranium fuel manufacturing plant for BWR
- Uranium fuel manufacturing plant for PWR
- MOX fuel manufacturing plant
- Uranium reconversion
- Uranium enrichment plant
- Reprocessing plant
- Mine
- Others

Status

- Operable
- Under construction
- Permanently shut down

GNF-Japan - Global Nuclear Fuel - Japan
 JAERI - Japan Atomic Energy Research Institute
 JNC - Japan Nuclear Cycle Development Institute
 JNFL - Japan Nuclear Fuel Ltd.
 NFI - Nuclear Fuel Industry



- Rokkasho Village, Aomori Prefecture**
- Reprocessing Plant JNFL
 - Uranium Enrichment Plant JNFL
 - Low-level Radioactive Waste Disposal Center JNFL
 - High-level Radioactive Waste Storage Center JNFL
- Tokai Village, Ibaraki Prefecture**
- Mitsubishi Nuclear Fuel
 - Mitsubishi Nuclear Fuel
 - JCO Tokai Plant
 - NFI Tokai Plant
 - Plutonium Fuel Production Facility (PFPF) JAEA
 - JRR-3M JAEA
 - TCA JAEA
 - JRR-4 JAEA
 - FCA JAEA
 - NSRR JAEA
 - TRACY JAEA
 - Yayoi Tokyo University
 - STACY JAEA
 - Tokai Reprocessing Plant JAEA
 - Tokai Vitrification Facility JAEA
- Oarai Town, Ibaraki Prefecture**
- HTTR JAEA
 - JMTR JAEA
 - Joyo Experimental Fast Breeder Reactor* JAEA

*Does not have breeding ability. Currently being re-constructed to be used as a research reactor.

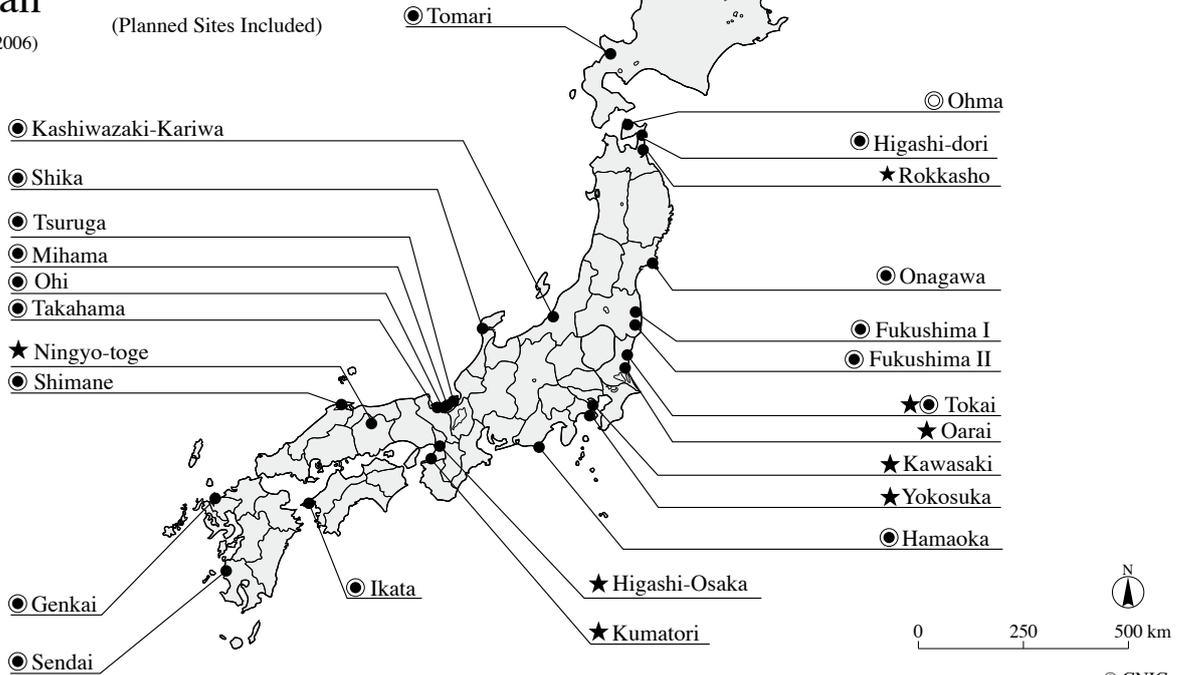
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Nuclear Plants and Facilities in Japan

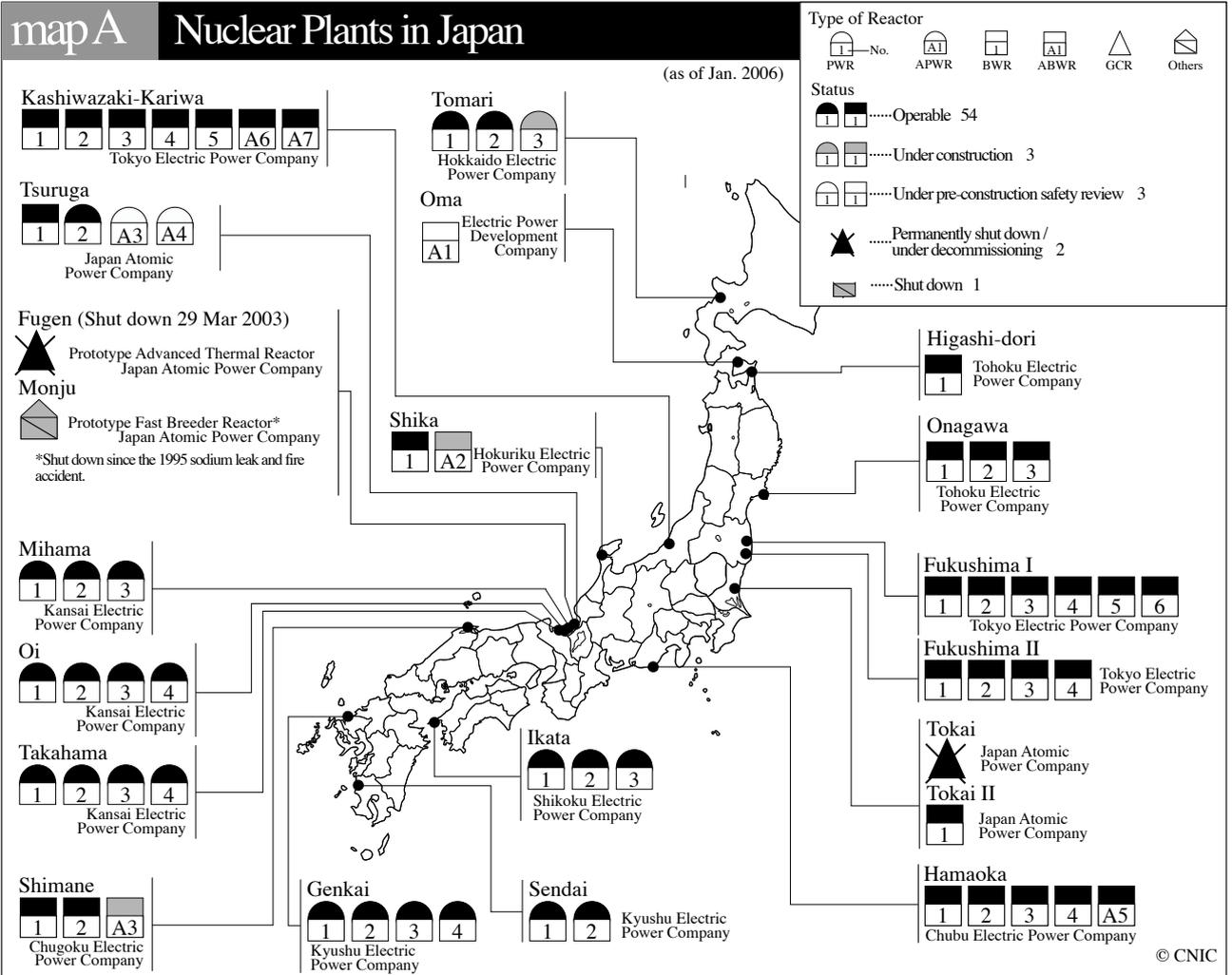
(as of Jan. 2006)

(Planned Sites Included)

● Nuclear Plants map A
★ Nuclear Facilities map B



© CNIC



A mobile nuclear reactor comes to Tokyo Bay

By Tsutomu Hirose*

Nuclear submarines frequently visit the US's Yokosuka Naval Base. Last year nuclear submarines visited 17 times for a total of 127 port days. That is down from what it once was, but it still means nuclear warships are going in and out of the overcrowded Tokyo Bay. However, now an even more dangerous situation is about to be brought upon us.

On October 27th last year the US government gave notice that Yokosuka was to become the home port for a Nimitz class aircraft carrier. It would replace the current conventional carrier, Kitty Hawk, which is fueled by heavy and light oil and is to be retired in 2008. So what were all those promises about consulting the local people and respecting their views? We are outraged at the US and Japanese governments.

In an article for the Asahi Shimbun newspaper (November 12th), Rear Admiral James Kelly, Commander of the US Naval Forces in Japan wrote, "The security environment in the Western Pacific region increasingly requires that the U.S. Navy station its most technologically and operationally capable ships forward from the United States, working with our Allies and friends from established forward-deployed positions." He went on to state, "The people of Japan can be assured of the safety of U.S. nuclear-powered warships. U.S. nuclear-powered warships have safely operated for more than 50 years without a reactor accident or any release of radioactivity that has had an adverse effect on human health, marine life, or the quality of the environment."

This shows the US Navy's firm intention to preserve its overwhelming strike power in East Asia and to maintain the forward deployment posture which enables it to go beyond the framework of the Japan-US Security Treaty and rapidly strike regions such as the Middle East. A fundamental problem with home porting a nuclear aircraft carrier in Yokosuka is that it means Yokosuka and Japan will remain deeply involved in US military activities which are illegal under international law, such as the war against Iraq. However, even looking at it from the position of

the US government, its aims could be achieved without a nuclear carrier. Indeed, arguments based on cost-benefit analyses have existed for a long time to the effect that it would be better to focus the fleet around a different warship. Is it perhaps more about securing nuclear technology and employment than about military necessity?

So what about safety? Aircraft carriers in themselves present big problems. Huge at about 300 meters long, they are nevertheless too short for an aircraft runway. When aircraft take off they are assisted by a catapult and when they land they are forcibly stopped using a wire, all while the carrier is moving at full speed. This is very difficult. Aircraft which fail often land in the sea. Therefore, they conduct endless difficult take-off and landing drills, which make the noise around Atsugi Base unbearable and cause residents to live in fear of crashes.

There is an even greater problem with nuclear aircraft carriers. The nuclear reactor which powers them uses highly enriched (weapons grade) uranium. Consequently, frequent adjustments have to be made. Sometimes they are brought to full power in just one minute. It is a design which is unthinkable for nuclear power plants. So aircraft carriers are nuclear reactors, which float around on the ocean carrying large numbers of nuclear weapons. Can they withstand torpedoes and the like? And surely there must be a limit to the measures for accident prevention and radiation leaks available on a ship. Clearly, they represent a different level of danger from nuclear power plants. Yet Kelly is trying to tell us that the safety of nuclear warships (nuclear submarines included) is guaranteed and that there have never been any accidents.

Unfortunately, many accidents have occurred. Just considering the accidents discovered as a result of research by US groups, which represent only a fraction of the total, there have been cases of illness and radiation exposure to operators and sailors, releases of high-level radiation into harbors and into the atmosphere, and situations that were just one step short of becoming full-

blown disasters. Even if one were to be generous and admit that there haven't been any disasters like Chernobyl, there is no guarantee that there won't be any in future.

An email reply from the Commander US Naval Forces Japan to the Asahi Shimbun was published in the newspaper's 23 December 2005 edition. The reply says, "A radiation related emergency is almost impossible"¹, but this is effectively an admission that there is a slight chance of such a situation arising. We don't expect that there will in fact be a major accident, but it is not impossible. The City of Yokosuka takes the same attitude. So the question arises, "What should be done about it?" The email continues, "If this situation arises, emergency response procedures will be activated, including informing the Japanese government." We are reassured that a manual covering this eventuality exists, but "Internal procedures for emergency responses to radiation incidents on nuclear warships only envisage action by the navy and cannot be published." In the case of aircraft carriers based in the US, it is asserted that "There are no special provisions [for residents], such as distributing iodine tablets or evacuation in the case of a nuclear accident."

Shall we conclude then that though an accident is not impossible, there is no chance of it having an impact outside the nuclear warship? But the timing and contents of the notification are in the hands of the US military and there is no detailed explanation of the preventative measures that have been taken. (The explanations for nuclear power plants might be inadequate, but this is in a different league.) Would you go along with them if the military said to you, "Detailed, objective information cannot be released because it is a military secret, but trust us"? We know of lots of mistakes made by the US military. It used its own soldiers and citizens as guinea pigs during nuclear tests and exposed them to depleted uranium....

The fact is that beneath the surface preparations to home port a nuclear carrier have been steadily proceeding. A typical example is the extension of the pier of the number 12 berth. However, both the US and Japanese governments kept saying that this was for the current carrier. On 26 April 2004 then Yokosuka Mayor, Hideo Sawada, insisted for the first time that if this is

the case the replacement should be a conventional carrier. That was effectively a declaration rejecting a nuclear carrier. The present Mayor, Rouchi Kabaya, has continued this attitude.

This attitude is backed up strongly by a petition to the mayor and the governor initiated by the Citizens' Group Concerned About Yokosuka Becoming Home Port for U.S. Nuclear-powered Aircraft Carriers, of which we are members. So far over 350,000 signatures, mainly from within Kanagawa Prefecture, have been submitted and signatures are still being collected. The purpose is to encourage the mayor to exercise to the full his power as controller of the port, in order to prevent it becoming the home port for a nuclear aircraft carrier. In the future the US and Japanese governments will probably give notice of construction of facilities and dredging for the nuclear carrier. This is where we hope Mayor Kabaya will show his mettle. For that purpose we are carrying out all sorts of original actions.

The nuclear submarines mentioned at the beginning of this article stay a few days at a time. However, a home ported nuclear aircraft carrier would be in port for half of the year and it is believed to have two 200 MW reactors on board (each 6 times the power of nuclear submarine reactors). Refueling will not be carried out, but the risk of an accident in the course of regular maintenance will be greatly increased.

If the 10-kilometer radius used for nuclear power plants is applied, all of Yokosuka, Zushi, Hayama and the southern part of Yokohama fall within the emergency planning zone. There are 770,000 people living in this area.

For us there is just one good thing in all this. That is that we might really come to understand the feelings of people living near nuclear power plants.

1. English versions of the email message quoted here were not found. The original of the November 12th Asahi Shimbun article quoted in paragraph three, was found on the Commander, U.S. Naval Forces, Japan web site.

**Tutomu Hirosawa is a member of Non-nuclear Citizens' Manifesto Campaign, Yokosuka*

Atomic Energy Commission rubber stamps power companies' plutonium utilization plans

The following significant developments emerged in regard to the Rokkasho Reprocessing Plant and Japan's Plutonium Utilization Plan as this edition of NIT was going to press:

1. On 23 January Japan Nuclear Fuel Ltd. announced the end of uranium tests.
2. On 24 January Japan Atomic Energy Commission judged the electric power company's Plutonium Utilization Plan to be appropriate.
3. It is likely that Aomori Prefecture will sign a safety agreement in March, given that the Aomori Parliament begins sitting late February.
4. With these obstacles cleared we would expect active tests using spent nuclear fuel to commence around April.

Pages 10 to 13 present some of the documents we have released in response to these developments.

Media Briefing

(11 January 2006)

----"No" to Start-Up of Active Testing at Rokkasho Reprocessing Plant----

Japanese NGOs Label Electric Utility Plutonium Utilization Plan "Fiction" Concern Raised that Atomic Energy Commission may Rubber-Stamp Plan

Japanese NGOs yesterday released a scathing critique¹ of the Plutonium Utilization Plan issued by the Federation of Electric Power Companies (FEPCO) on 6 January, dubbing the plan as "fiction" and pointing out that it does not comply with specifications stipulated by the Japanese Atomic Energy Commission (JAEC) in 2003.

At this time there is concern JAEC may approve this plan as early as mid-month in order to start "active testing" at the Rokkasho Reprocessing Plant.² Regional and local authorities' opposition to the plan is expected.

Rushing to Start "Active Tests" at Rokkasho Reprocessing Plant

The Plutonium Utilization Plan covers the use of plutonium fuel, known as MOX fuel, in nuclear power plants³ operated by Japan's electric power companies. However, none of the reactors slated under the plan have received consent from local authorities to consume the material.

In February 1997, the government of Japan made a written commitment to the International Atomic Energy Agency (IAEA) to uphold the "principle of no surplus plutonium". Based on this, JAEC issued a decision on 5 August 2003 stipulating that electric utilities must state the amount, location, starting date, and length of time required to consume MOX fuel before spent nuclear fuel can be reprocessed to extract plutonium at the Rokkasho reprocessing plant.

The plan issued by FEPCO falls far short of this requirement. There is concern that JAEC will rubber-stamp it in the rush to start "active testing" at the Rokkasho reprocessing plant. Active testing is currently scheduled to begin in February. During the active tests the Rokkasho Reprocessing Plant will extract plutonium from spent fuel for the first time. According to the plan, 1.6 tons of plutonium will be extracted during fiscal years 2005 and 2006, enough for 200 Nagasaki type nuclear bombs.

Plan will Increase Plutonium Stockpile in Japan

This plan ignores the plutonium that Japan already possesses. Japan already has a surplus of 43.1 tons of plutonium (37.4 tons held in Europe and 5.7 tons held in Japan). The plutonium surplus continues to grow, despite the 1997 "no surplus plutonium" pledge.

An earlier Plutonium Utilization Plan, relating to plutonium held overseas, was submitted to the IAEA in December 1997. The plan, along with the "no surplus plutonium" commitment, was published in IAEA INFCIRC/549/Add.1, 31 March 1998. No MOX fuel has been used in Japan's nuclear power plants in accordance with this 1997 plan because it foundered.

NGOs point out that the latest FEPCO plan is simply a copy-and-paste job of the 1997 plan. Under the former plan, utilities were to consume MOX fuel at 16 to 18 reactors. The number of reactors slated this time is identical to the 1997 plan, but the latest plan relates to plutonium separated in Japan at the Rokkasho reprocessing plant. No explanation is given regarding the overseas plutonium, so it must be assumed that separating more plutonium now will add to the existing surplus. (Japan's "Framework for Nuclear Energy Policy" issued October 2005 by the JAEC gives priority to the consumption of the plutonium in Europe over any produced at Rokkasho.⁴)

Plan Fails to Provide Required Information

The plan fails to provide the minimum information required by JAEC's 2003 decision.

It effectively says nothing about the time of commencement, or the time required to use the plutonium. It says that the plutonium will be used "in and after 2012". However, this is just a statement of the obvious. Plutonium extracted at Rokkasho is to be fabricated into MOX fuel at the MOX Fuel Fabrication Plant, but this plant has not been built and is only "expected" to commence operation by 2012⁵. Apparently the time required to use the plutonium is just calculated on the basis of the number of reactors and their power output. There is no indication of by when all the plutonium will be used.

Regarding the location, reactors where the plutonium will be used are identified for only six companies: Kansai Electric, Kyushu Electric, Shikoku Electric, Chugoku Electric, Chubu Electric and Japan Atomic Power Company. The remaining four companies fail to specify which reactors will be used: Tokyo Electric, Hokuriku Electric, Tohoku Electric and Hokkaido Electric. Due to local opposition and past scandals, Kansai Electric and Tokyo Electric were forced to refer to the need to recover public trust before their plans can be implemented.

No company has obtained the prior consent of the prefectural or local governments except Kansai Electric and three have not even applied for prior consent. Previously granted consent was withdrawn by Niigata and Fukushima Prefectures (Tokyo Electric). Kansai Electric states it is not in the position to proceed with the Plutothermal (MOX fuel use) program at this time due to the 2004 Mihama nuclear power plant accident.

Regarding the amount to be used by each company, some plutonium is to be allocated to companies which will have no spent fuel reprocessed in fiscal 2005 and 2006. This will put pressure on these companies to proceed with Plutothermal plans, even though they are not ready to do so.

Plutonium is also allocated to the non-existent Ohma Nuclear Power Plant. Ohma is still under review for a nuclear reactor installation license. It is still not certain Ohma will be built. Not surprisingly, no date is specified for plutonium use at Ohma.

Japan's Atomic Energy Commission Must Not Accept Plan

Clearly FEPCO's latest Plutonium Utilization Plan is not based on reality. The purpose of the plan is simply to enable the Rokkasho reprocessing plant to start "active tests" in February.

JAEC should uphold its own 2003 decision and state clearly that the plan is inappropriate. It should declare that "active tests" cannot begin at Rokkasho.

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FOOTNOTES:

1. On 10 January, twenty-five NGOs from Fukushima, Niigata, Fukui prefectures, Tokyo and Kansai metropolitan areas, and Kyushu issued a critique on FEPCO's Plutonium Utilization Plan.
2. The Rokkasho Reprocessing plant located in Aomori Prefecture, Japan is under construction and currently undergoing uranium commissioning. The plant has the capacity to reprocess 800 tons/HM of spent nuclear fuel a year. At full capacity, Rokkasho is capable of separating approximately 8 tons of plutonium annually.
3. The use of plutonium fuel in light water reactors ('thermal' reactors as opposed to 'fast' reactors) is called 'plutothermal'. The fuel is made from a mixed oxide of plutonium and uranium, commonly referred to as MOX.
4. Japan Atomic Energy Commission, "Framework for Nuclear Energy Policy", 14 October 2005, p.11.
5. Ibid., p. 34.

Petition urging IAEA Action

Ensure Japan Upholds its International Commitment To Not Produce Surplus Plutonium

The government of Japan made a written and unequivocal pledge to the International Atomic Energy Agency (IAEA) in December 1997 to uphold the "principle of no surplus plutonium."¹

Despite this commitment, Japan will separate out 4 tons of plutonium at the Rokkasho reprocessing plant, if active testing using spent nuclear fuel begins as scheduled in February 2006. The stark fact is that the Japanese nuclear power program has no use for this plutonium, now or in the foreseeable future.

The "Plutonium Utilization Plan of Japan" presented to the IAEA in 1997 stated that mixed plutonium-uranium oxide (MOX) fuel in light water reactors would be the "principle way of utilizing plutonium in Japan over the next few decades." The program, however, has never gotten off the ground due to public opposition, data falsification scandals in 1999 and 2002 and the fatal accident at the Mihama nuclear power plant in 2004. Today, not a single electric utility has the go ahead to consume MOX fuel.

Furthermore, a fundamental technical problem exists. Japan lacks the capability to turn any plutonium produced at Rokkasho into MOX fuel. There is only a government "expectation" that a MOX fuel fabrication plant be fully operational by fiscal 2012.² Therefore, if active testing begins at Rokkasho this year, any separated plutonium will languish at the facility.

Moreover, a massive cache of Japanese plutonium already exists: thirty-seven tons sit in Europe. Japan's Framework for Nuclear Energy Policy issued in October 2005 gives priority to the consumption of this plutonium in Europe over any produced at Rokkasho.³

Japan allowed the stockpile in Europe to grow even after the MOX program fell apart, although it was clear the plutonium could not be consumed. Now, it is set to accumulate more plutonium, this time in Japan.

Simply put, Japan already has tons of plutonium and no way to burn it. Further stockpiling is not only irresponsible but also a clear break with Japan's pledge to produce no surplus plutonium.

Japan originally made this commitment in the interests of nuclear non-proliferation and disarmament, a field in which it is a valuable leader. Given the heightened political tension around disarmament and non-proliferation in North East Asia, and its role as Chair of the IAEA Board of Governors, Japan should not renege on this commitment.

For these reasons, Japan should indefinitely postpone active testing at the Rokkasho reprocessing plant.

PETITION

To ensure that Japan does not breach its international commitment to the "principle of no surplus plutonium", we urge the IAEA Secretariat and Board of Governors to immediately discuss this matter and quickly take appropriate action before active testing begins at Rokkasho and plutonium is accumulated.

5 January 2006

Hideyuki Ban (Co-Director) Citizens' Nuclear Information Center

Aileen Mioko Smith (Director) Green Action

Atsuko Nogawa (Nuclear Campaigner) Greenpeace Japan

1. International Atomic Energy Agency, "Communication Received from Certain Member States Concerning their Policies Regarding the Management of Plutonium", INFCIRC/549/Add. 1, 31 March 1998. Available at <http://www.iaea.org/Publications/Documents/Infcircs/1998/infcirc549a1.pdf>

2. Japan Atomic Energy Commission, "Framework for Nuclear Energy Policy", 14 October 2005, p.34. Available at <http://aec.jst.go.jp/jicst/NC/eng/index.htm>

3. Ibid, p.11.

Federation of Electric Power Companies of Japan (6 January 2006)
Utilization Plan for Plutonium Recovered at Rokkasho Reprocessing Plant (Fiscal Years 2005-2006)

Owner	amount to be reprocessed *1	amount of Pu owned *2	purpose (to be used as fuel for Light Water Reactors) *3	amount to be used (projected amount to be used annually *5 tonPu/f/year) *4	time planned to start using Pu*6, approximate length of time required to use Pu *7
	FY2005	FY2006			
Hokkaido			0	0	In and after FY2012, about 0.5 years equivalent
Tohoku			0	0.2	In and after FY2012, about 0.5 years equivalent
Tokyo	67		0.5	0.9-1.6	In and after FY2012, about 0.3 to 0.6 years equivalent
Chubu			0	0.4	In and after FY2012, about 0.3 years equivalent
Hokuriku			0	0.1	In and after FY2012, about 0.2 years equivalent
Kansai	130		0.4	1.1-1.4	In and after FY2012, about 0.3 to 0.4 years equivalent
Chugoku			0	0.2	In and after FY2012, about 0.5 years equivalent
Shikoku			0	0.4	In and after FY2012, about 0.3 years equivalent
Kyushu	15	48	0	0.4	In and after FY2012, about 0.5 years equivalent
JAPCO		13	0	0.5	In and after FY2012, about 0.2 years equivalent
sub total	15	258	0.1	4.4-5.4	
J-power			will be transferred from other utilities *8	1.1	
Grand Total	273		1.6	5.5-6.5	

More details will be added as the plutonium program proceeds and the MOX fuel fabrication plant comes on line.

*1. The 'amount to be reprocessed' is in accordance with the Reprocessing Plan put together by Japan Nuclear Fuel Limited.

*2. The 'amount of Pu owned' is the amount of plutonium that is expected to be allocated to each company from the plutonium recovered at the Rokkasho reprocessing plant in FY2005 and FY 2006. The recovered plutonium will be allocated to each power company according to the amount of plutonium contained in the spent nuclear fuel they sent to the Rokkasho Reprocessing Plant. Consequently, plutonium may be allocated to some companies whose plutonium was not actually reprocessed in FY2005 and FY2006. However, when all spent fuel has been reprocessed, the amount of plutonium allocated to each company will correspond to the amount of fissile plutonium contained in the spent fuel that they sent for reprocessing.

*3. Besides the amount to be used in LWRs, some plutonium will be handed over to JAEA to be used in their research projects. The amount to be handed over from each power company to JAEA will be announced when it is decided.

*4. The 'amount of plutonium to be allocated' is shown in terms of fissile plutonium. The amount allocated to each company is rounded to the first decimal place, so in some cases a value of 0.0 is shown and the total of these figures might not add up to the grand total shown.

*5. The 'projected amount to be used annually' calculates the amount of plutonium contained in MOX fuel to be loaded according to the plan provided by each power company, adjusted to a yearly basis. There are cases where the amount of plutonium to be used includes plutonium recovered overseas.

*6. The 'time planned to start using Pu' is after 2012, when the planned MOX fuel fabrication plant, located next to the Rokkasho Reprocessing Plant, is planned to start operating. Until the MOX plant commences operations, recovered plutonium will be managed and stored at the Rokkasho Reprocessing Plant in the form of mixed oxide uranium and plutonium powder.

*7. The 'approximate length of time required to use the recovered plutonium' is calculated by dividing the amount owned by the amount used. (Note that due to the fact that some plutonium is to be handed over to J-Power and JAEA, and because 'the amount to be used' includes plutonium stored overseas, the actual time taken may not match the span shown here.)

*8. The amount to be handed over from other power companies to J-Power will be announced after it has been decided.

Group Introduction:

Shizuoka Network of Citizens Opposed to the Hamaoka Nuclear Power Plant

by Chiyoko Tsukamoto*

The first reactor at Chubu Electric Power Company's Hamaoka Nuclear Power Plant (NPP) in Omaezaki City, Shizuoka Prefecture, commenced operations in 1976. There are now five reactors at the plant. From the beginning there were people who warned of the dangers of nuclear power, but particularly after the Chernobyl accident many people began to feel uneasy about nuclear power and small groups of concerned citizens became active throughout Shizuoka Prefecture. However, the groups were not very influential and they found it very difficult to appeal to the general public. More recently there have been several accidents and problems at the plant. For example, in one very dangerous incident two recirculation pumps stopped working.

In this context, several citizens' groups banded together to form the Shizuoka Network of Citizens Opposed to the Hamaoka NPP. The network focuses on the question of whether the Hamaoka NPP is capable of withstanding the widely predicted Tokai Earthquake¹. The epicenter of this earthquake is predicted to be directly beneath Shizuoka Prefecture. Great Tokai Earthquakes of magnitude 8 and above have hit the Tokai region repeatedly, coming in 100-150 year cycles. Now at last researchers have begun to understand the mechanism of these earthquakes. However, when the Hamaoka NPP was constructed these earthquakes were not well understood and the risk was grossly underestimated. Consequently, doubts have arisen about the capacity of the Hamaoka NPP to withstand a major earthquake. Hamaoka is the only NPP in the world situated directly above the predicted epicenter of a major earthquake. This represents an unparalleled danger. If, amidst the widespread destruction caused by a major earthquake, a catastrophic accident were to occur at the Hamaoka NPP, the fallout would not be restricted to Shizuoka. It would be global in scale.

The network has 300 members, but many of them are busy with work and family commitments. Effectively about ten members are able to devote



a lot of time to this issue. As a result of the public lectures and other events that we have held and our lobbying of local government, many people who were previously uninterested have come to recognize the problem. However nuclear power is government policy, so it is not easy to stop. Since the last Tokai Earthquake, 150 years have passed. The next one could strike tomorrow. Aware of this imminent danger, we decided to launch a court case. We want the Hamaoka NPP to be stopped, even if operations are only suspended until the next earthquake has passed. We have obtained 2,200 supporters from all around Japan and are currently fighting in court for operation of the plant to be terminated.

We would be very glad if voices calling for the termination of the Hamaoka NPP were heard not just from within Japan, but from all over the world. So please tell Shizuoka Prefecture and Chubu Electric Power Company that the Hamaoka NPP should be closed down².

1. The Tokai region is on the Pacific coast of Honshu. It can be roughly thought of as including Shizuoka, Aichi and Mie Prefectures.

2. Links to these organisations' web sites are as follows:

Chubu Electric: <http://www.chuden.co.jp/english/>
Shizuoka Prefecture: <http://www.pref.shizuoka.jp/kikaku/ki-20/english/index.htm>

* Chiyoko Tsukamoto is a member of the Shizuoka Network of Citizens Opposed to the Hamaoka Nuclear Power Plant.

NEWS WATCH

Toshiba wins bid for Westinghouse

As this issue of NIT was going to press, it was reported that Toshiba had won the bid for British Nuclear Group's Westinghouse Electric Company. According to media reports, Toshiba bid an estimated \$5 billion. It won the bid ahead of two other Japanese companies, Mitsubishi Heavy Industries (MHI) and Hitachi, both of which had US partners in their bid. It had been thought that MHI was the front-runner, because, like Westinghouse, it builds Pressurized Water Reactors (PWR). Toshiba and Hitachi build Boiling Water Reactors (BWR). However, through the purchase of Westinghouse, Toshiba's portfolio will expand to cover both BWRs and PWRs.

Company established for intermediate storage of spent fuel

A company for intermediate storage of spent fuel was jointly established on November 21st in Mutsu City, Aomori Prefecture, by Tokyo Electric Power Company (80%) and Japan Atomic Power Co. (20%). It was named Recyclable-Fuel Storage Company.

On November 30th the company started an in-depth survey for the construction of the facility in Mutsu City.

Construction of Shimane-3 launched

Construction of Chugoku Electric Power Company's Shimane-3 reactor (ABWR, 1373 MW) commenced on December 22nd after the construction plan was approved by the Minister of Economy, Trade and Industry. The reactor is being constructed in Matsue City, Shimane Prefecture. Prior to this, on December 9th the company amended its application for approval, increasing the amount of reinforcing steel for some parts of the reactor building and the reactor containment vessel, in order to improve earthquake safety. Commercial operation is

scheduled to begin in December 2011.

Mitsubishi Heavy Industries receives two PBMR contracts

On December 6th Mitsubishi Heavy Industries (MHI) received orders from PBMR Pty. Ltd. of South Africa for basic design and materials, including forgings, for the core barrel assembly of its Pebble Bed Modular Reactor Demonstration Power Plant. Since 2001 MHI has been participating in the feasibility study for the PBMR project. In 2004 it received orders for the basic design of a helium gas turbine generator and for a concept review for the core barrel assembly. MHI hopes to receive an order to build the core barrel assembly during 2006.

Mihama-3 suspension order lifted

An order suspending the operation of Kansai Electric Power Company's Mihama-3 reactor (PWR, 826 MW) was lifted on 5 December 2005. The reactor has been out of operation since an accident on 9 August 2004, which took the lives of five people and injured six others (NIT 102, 103, 106). The order to suspend operations was originally made by the Minister of Economy, Trade and Industry on 27 September 2005. The suspension order was lifted the day the Nuclear and Industrial Safety Agency confirmed that the pipes ruptured by the accident had been replaced and met the technical standards.

However, on November 2nd it was revealed that a Mitsubishi Heavy Industries worker had mistakenly connected the wrong pipe (same model) during the replacement work and that he had attempted to pass it off by falsifying the code number of the pipe. The governor of Fukui Prefecture stated that the recent lifting of the suspension would not necessarily lead to the resumption of operation of the reactor. He

indicated that he would wait and see what kind of attitude Kansai Electric would take before making a decision.

Onagawa-2 resumes operation

As reported in NIT 108, all three reactors tripped automatically at Tohoku Electric Power Company's Onagawa Nuclear Power Plant in response to the 16 August 2005 Miyagi earthquake. Of these, Onagawa-2 reactor (BWR, 825 MW) resumed operation on January 17th. Both this earthquake and also one which occurred in May 2003 exceeded the design basis quake used for the original safety assessment. However, on November 25th Tohoku Electric reported to the Nuclear and Industrial Safety Agency (NISA) that it was able to confirm that the reactors could withstand an even bigger earthquake. On December 26th NISA informed Miyagi Prefecture, Onagawa Town and Ishinomaki City that "safety is confirmed" and they gave their consent for the resumption of operations. Safety assessments of No. 1 and No. 2 reactors will now follow, after which it is expected that they too will resume operation.

General Electric and three Japanese firms sign agreement on ESBWR

On December 16 General Electric (GE) concluded a partnership agreement with Hitachi, Toshiba and Shimizu Corporation to proceed with the Evolutionary Simplified Boiling Water Reactor (ESBWR). According to the agreement, wherever an ESBWR is employed throughout the world, the four firms will construct the reactor jointly. The ESBWR is a next generation 1550 MW large-scale reactor. GE has applied for approval

from the U.S. Nuclear Regulatory Commission and Entergy Nuclear is said to be a promising candidate. China is also being lobbied to use ESBWR.

Notice re Subscriptions

Readers in Japan

Please note that from April we will ask subscribers to cover the post office fee when paying their subscription. Until now CNIC has covered these costs, but the fee will increase in April. Unfortunately we are no longer able to cover this expense.

We apologize for this extra burden, but hope you will understand the predicament of shoe-string operations such as CNIC.

The change will be reflected in a change from a red postal money transfer form to a blue form. Subscription fee notices sent out with this edition are accompanied by the red form, because CNIC will continue to bear this expense until the end of March.

Overseas readers

We sent out a request for donations with the last edition of NIT. Since then the bank name for bank transfers has changed. The new name is Bank of Tokyo-Mitsubishi UFJ, Ltd.. All other details remain the same.

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