

# NUKE INFO TOKYO

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Citizens' Nuclear Information Center

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3F Kotobuki Bldg., 1-58-15, Higashi-nakano, Nakano-ku, Tokyo 164-0003, JAPAN  
URL: <http://cnic.jp/english/> e-mail: [cnic@nifty.com](mailto:cnic@nifty.com)

## New Nuclear Policy-Planning Council



Scenes from an international symposium held on 4 September involving ICRC members (see pages 4 & 5)

From time to time NGOs are invited to send representatives to government policy committees and the like. Frequently, they do so knowing full well that they will be marginalized and that their proposals won't be adopted. CNIC joined the Atomic Energy Commission's (AEC) New Nuclear Policy-Planning Council (the Council) fully aware that this is the way it would probably turn out (NIT101). So far, they haven't surprised us by allowing us to exert substantial influence.

Nuclear Energy. The change in name this time reflects the view that the role of the AEC is only to determine basic policy, while it is up to the various government departments and agencies to fill in the details. Also, the Draft Outline is not seen as binding on private enterprise. Reflecting this view, it speaks throughout of hopes and expectations in regard to the decisions of private companies, although in practice they have little room to deviate from official policy. This is particularly true in regard to the backend of the nuclear fuel

### Draft Nuclear Energy Policy Outline

On July 29th, the AEC released the Council's Draft Nuclear Energy Policy Outline (Draft Outline). There was a four-week public comment period and the Council will meet soon after the election (September 11th) to consider the comments it received. It is highly likely that the draft will be endorsed as official policy quite quickly.

In the past the equivalent document was referred to as the Long-term Program for Research, Development, and Utilization of

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cycle (reprocessing, plutonium use and disposal of radioactive waste). However, the government cannot force them to meet its goals for nuclear power generation, or to build new nuclear reactors if they perceive nuclear power to be uneconomic.

The Draft Outline is the culmination of deliberations which began in June 2004. The Council issued ten interim reports and discussion documents prior to the Draft Outline. Of these, Nuke Info Tokyo has covered the Interim Report Concerning the Nuclear Fuel Cycle, released on 12 November 2004 (NIT 104). The Draft Outline is based on the contents of these earlier documents.

According to the Draft Outline, Japan's policy is to use nuclear energy for strictly peaceful purposes and to ensure that it is used safely. The aim is to provide a secure supply of energy, to contribute to social welfare and to raise the standard of living of the citizens. The Draft Outline also takes the view that nuclear energy contributes to the amelioration of climate change. The scope of the Draft Outline is not restricted to nuclear energy. It also covers the research, industrial and medical use of radiation, but nuclear energy is the main focus. It claims to be a plan for the next ten years, but in fact it sets objectives for the next half century.

Major features of the proposed policy are as follows:

- (i) The historical policy of "reprocessing spent fuel and effectively using the plutonium and uranium recovered" is reconfirmed.
- (ii) For the time being, spent fuel will be reprocessed up to the limit of the capacity of the Rokkasho Reprocessing Plant. The remainder will be stored. From 2010 consideration will be given to the question of what to do with the excess spent uranium fuel and with spent MOX fuel. A decision will be made well before the Rokkasho Reprocessing Plant is closed down.
- (iii) Research should be conducted into technology for the direct disposal of spent fuel to ensure policy flexibility.
- (iv) After 2030, nuclear power will at least maintain its present percentage of around 30-40% of electric power.
- (v) From around 2030, existing reactors will be replaced by improved light water reactors.
- (vi) Fast breeder reactors will be commercialized around 2050.
- (vii) The pluthermal program (use of MOX fuel in light water reactors) will go ahead.
- (viii) The aim is to have an operational site for the

geological disposal of high-level waste by around 2030.

(ix) It is expected that geological disposal will be used for some trans-uranium wastes. This may be at the same site as the high-level waste site.

### **International Review of Reprocessing Policy**

Because Japan's policy in regard to reprocessing and the use of plutonium is not simply a domestic issue, but one with serious international implications, an independent international panel was established to conduct a review of the Interim Report Concerning the Nuclear Fuel Cycle (Interim Report) issued last November (NIT 105). The International Chokei' Review Commission (ICRC) has now completed its review. ICRC's four overseas and five Japanese members were very critical of the methodology and the conclusions of the Interim Report.

The major defect with the methodology was that no clear system was established for prioritizing and weighting the individual items for assessment. Rather, a de facto weighting system was applied on the following basis. Those perspectives which were advantageous for the reprocessing option were emphasized, while those which were disadvantageous were either not taken into consideration or were played down. The reverse approach was applied to the direct disposal option. Whereas the real weaknesses of reprocessing were considered to be of no significance, imagination was employed to the utmost when identifying the weaknesses of direct disposal. In this way, the Interim Report was able to reach the conclusion that the reprocessing option was superior to the direct disposal option.

The biased approach taken in the Interim Report led to some quite bizarre conclusions. For example, it concluded, without analysis, that there was no significant difference between the reprocessing option and the direct disposal option in regard to the risk of nuclear proliferation. It reached this counter-intuitive conclusion by conflating the clear and present risk presented by above-ground separated plutonium with the risk, hundreds to tens of thousands of years hence, of plutonium buried with the spent fuel in geological repositories. This, it implied, could become a mine for weapons-usable plutonium. That assumes, of course, that human beings will still be capable of and interested in mining plutonium for nuclear weapons that far in the future.

This is just one example of the obvious bias of

the Interim Report. Many more could be given if space allowed. But the purpose of the Interim Report was not to provide rational analysis. It was never intended to be anything other than a political exercise to clear the way for reprocessing. In this it was very successful. Although the Interim Report was just that - interim - and although the Draft Outline issued in July is still only a draft, both policy and praxis have been moving ahead at a rapid pace. Following the release of the Interim Report, Japan Nuclear Fuel Ltd. and the Ministry for Economy Trade and Industry immediately took action. Uranium commissioning of the Rokkasho Reprocessing Plant commenced in December 2004. Then, in May 2005, the Reprocessing Fund Law<sup>2</sup> was passed and became law. In this way, even before the finalization of the Nuclear Energy Policy Outline, major decisions have been taken based on the conclusions of the Interim Report.

### Future Prospects

Although implementation of the policy laid out in the Draft Outline has already begun, there are still major obstacles to be overcome. In regard to reprocessing and plutonium use, it is far from clear that these will progress smoothly. They present major unsolved technical and economic challenges. In regard to electric power generation targets, utilities' decisions about construction of new reactors will be based on commercial judgments. The international evidence suggests that nuclear is not the preferred choice in a competitive energy market. The Draft Outline is vague about how far the government will go to provide incentives for new nuclear power plants, but it indicates a clear preference for private enterprise to invest its own resources.

A major theme running through the Draft Outline is restoring public trust in nuclear energy. It acknowledges that accidents and scandals over the last decade have greatly damaged the public perception of nuclear energy. The solutions proposed are a commitment to a safety culture and prioritization of transparency, consultation, developing public understanding and so on. These are all fine sentiments. The problem is whether an inherently insular and secretive industry can deliver. Accidents and scandals of one sort or another keep popping up. It is very doubtful whether the nuclear industry can establish a clean track record for long enough for public distrust to subside. However, unless it does subside it will be exceedingly difficult to find candidate sites for new power

plants or radioactive waste disposal facilities.

### CNIC Participation

Over the last few years CNIC has challenged the AEC to public debates about its nuclear energy policy, particularly in regard to the nuclear fuel cycle. Given that background, there was logic in CNIC joining the New Nuclear Policy-Planning Council. It was a very vexed decision at the time, but we decided that our Co-Director, Hideyuki Ban, should represent us on the Council. He has submitted written and verbal statements to almost all the sessions. These are in themselves a valuable resource (only available in Japanese, unfortunately). It has also been a valuable learning experience for many of our staff.

However, there was one particular defect in the process that makes CNIC's future involvement problematic. Mid-way through the process, AEC's Chairman stated that AEC was legally bound to promote nuclear energy. It could not consider the option of phasing out nuclear energy. He based this claim on the wording of the Atomic Energy Basic Law. We believe that consideration should be given to changing this law, but even as it now stands, we disagree with this rigid interpretation. We strongly believe that nuclear policy reviews must consider the option of a nuclear phase-out.

Despite our criticisms of the process and conclusions of the New Nuclear Policy-Planning Council, we believe that our participation has been worthwhile. There were aspects of the deliberations this time which were different from previous Long-Term Nuclear Programs and which could lay the ground for future changes. Despite all its failings, the Interim Report for the first time ever gave credence to alternatives to reprocessing. Also, never before has so much attention been given to the loss of public trust caused by nuclear industry failures and to the need to ensure safety. CNIC was probably invited to participate to help give voice to these new perspectives. It will be very interesting to see whether future reviews build on these positive developments.

Philip White (NIT Editor)

1. Chokei refers to the Long-term Plan.
2. Our abbreviated translation

# Nuclear energy is not a controllable technology

## from Hiroshima and Nagasaki to the elimination of nuclear energy

### 60th anniversary of the atomic bombing

Two years after the bomb was dropped, Robert Oppenheimer, the father of the atomic bomb, said, "physicists have known sin and this is a knowledge which they cannot lose." However, it is necessary to separate the discovery of nuclear fission in the realm of science from the process which followed in the realm of technology to turn this into an atomic bomb. Nuclear weapons teach us that it is not enough to simply shrug our shoulders and say that scientists and technologists will always try to find an application for the latest knowledge.

This year it is sixty years since the bombing of Hiroshima and Nagasaki. I believe that international opinion is now strongly against nuclear weapons. However, the Non-Proliferation Treaty Review Conference in May ended in failure, and more and more countries are eager to pursue uranium enrichment and reprocessing, despite the fact that these technologies can be used to produce the material for nuclear weapons. Of course this is all related to international politics, but if we just lay the blame there, we will never find our way to the elimination of nuclear weapons.

### Rokkasho and nuclear proliferation

As discussed in the first article in this edition of NIT, Japan is looking to continue to pursue the nuclear fuel cycle under the new nuclear policy currently being developed. This policy involves extracting 8 tons of plutonium per year when the Rokkasho Reprocessing Plant is fully operational, despite the fact that Japan already has 43.1 tons of plutonium<sup>1</sup> and nobody knows whether the fast breeder reactor will ever become operational. There is no clear use for this plutonium, so the question is being asked, "what does Japan intend to do with such a large quantity of plutonium?" This is essentially the question that was raised in a new paper by Frank Barnaby and Shaun Burnie, *Thinking the Unthinkable: Japanese nuclear power and nuclear proliferation in East Asia*<sup>2</sup>. This paper, published jointly by CNIC and

Oxford Research Group, was written to mark the 60th anniversary of the atomic bombing and was released at anti-nuclear conferences held in Hiroshima and Nagasaki at the beginning of August.

The Japanese government takes the position that its use of nuclear energy is for exclusively peaceful purposes. To those who question this, the government replies that the Rokkasho Reprocessing Plant is covered by strict IAEA safeguards. However, the above paper argues that it is impossible to safeguard Rokkasho<sup>3</sup>. Even with the most up-to-date safeguards technologically available, "the potential material unaccounted for (MUF)...will be around 50 kg per year." In other words, the potential material unaccounted for amounts to about one nuclear weapon's worth of plutonium per month. It will be impossible to know whether it has been diverted, or whether it is lost somewhere inside the plant.

The report also warns, "Not one country that has initiated a nuclear weapons programme since 1945 has done so on the basis of a democratic debate." If the political conditions in Japan take a turn for the worse, it could develop nuclear weapons "within six months".

### International Symposium

On 4 September, Fukushima Prefecture hosted an international symposium in Tokyo to consider the nuclear fuel cycle (see photos on page 1 - Governor Sato standing). The forum included ten panelists, three overseas members (Christian Kueppers from Germany, Frank von Hippel from the USA, and Mycle Schneider from France) and four Japanese members of the ICRC review (see page 2), plus three pro-reprocessing Japanese experts. In the limited time available, the following three themes were debated: 'safety and environmental compatibility', 'energy security and nuclear non-proliferation', and 'economics and the cost of a change of policy'. For each theme the presentations of those opposed to reprocessing were convincing.

Regarding the non-proliferation theme, they

questioned the rush to start up the Rokkasho Reprocessing Plant, given Japan's plutonium surplus and the lack of any clear use for it. Why not stop and thoroughly debate the issue? The proponents of reprocessing responded to this question by saying that Japan's reprocessing technology has been accumulated as part of a long-term plan over a long period of time and that it must not be thrown away now. They also said that Japan's reprocessing program is proliferation-resistant because plutonium is not extracted by itself. Rather, it is mixed with uranium and fabricated into MOX fuel. In regard to the first point, the opponents pointed out that the technology will not be lost by pausing now. Mycle Schneider, of France, also contrasted the practical failings of reprocessing in other countries with the very theoretical and unrealistic attitude towards this technology of the proponents of reprocessing in Japan. In regard to the second point, allow me to quote Barnaby and Burnie again:

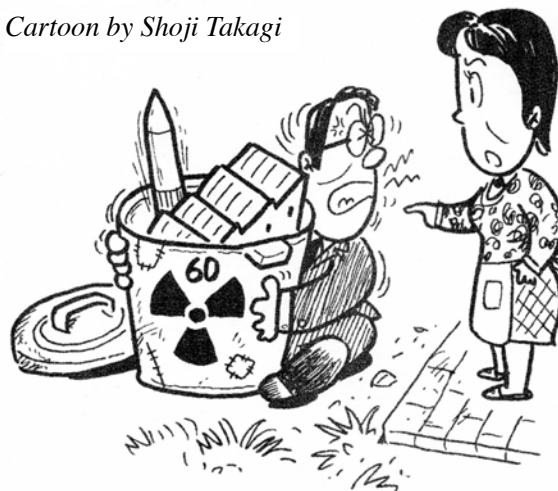
"The use of MOX increases the risk of nuclear-weapon proliferation. The necessary steps of chemically separating the plutonium dioxide from uranium dioxide and converting the dioxide into plutonium metal that can be used to fabricate nuclear weapons are relatively straightforward."

## Conclusion

Let us return to the words of Robert Oppenheimer quoted at the beginning of this article. Whether or not existing technologies, or technologies under development, should be accepted is something that the whole society should decide. When making such a decision, the first thing that should be considered is whether or not these technologies can be controlled. In some cases, even after a thorough debate, it may be impossible to judge until the technology is actually tried out. In those cases, the technology must be checked from time to time in the light of developments since it was introduced.

Technology involving radioactivity and the use of radiation has the potential to do irreversible damage to life systems. Development of such technology could even lead to the extinction of the human species. The lesson of history since the Manhattan Project produced the first atomic

Cartoon by Shoji Takagi



bomb is that there is no distinction between the military and the civilian use of plutonium. This is not an area to be pursued out of scientific curiosity. The top-secret development of nuclear weapons and the imposition of the nuclear fuel cycle without proper debate are very similar acts.

Japan should withdraw from this highly dangerous policy, euphemistically referred to as the "peaceful use of nuclear energy". It should not start up the Rokkasho Reprocessing Plant. Giving up reprocessing now would be a first step towards the elimination of nuclear weapons.

Yukio Yamaguchi (CNIC Co-Director)

1. The latest figures were released on September 6th and will be covered in detail in the next edition of NIT.
2. This paper can be obtained from CNIC, or downloaded from the following link:  
<http://cnic.jp/english/publications/orgjapanprolif.html>
3. CNIC Co-Director, Nishio Baku, has carried out a more detailed analysis of this, based on reports by IAEA and Japan Nuclear Fuel Ltd. technologists. It is available on CNIC's web site (in Japanese only).

# Onagawa reactors trip following Miyagi earthquake

On August 16th all three reactors tripped automatically at Tohoku Electric Power Company's Onagawa Nuclear Power Plant in response to a magnitude 7.2 earthquake off the coast of Miyagi Prefecture. The direct reason was that the quake exceeded the level set to trigger an automatic trip, in this case a horizontal acceleration of 200 gal<sup>1</sup> (table 1).

This was the third time that a reactor at the Onagawa NPP has tripped automatically because of an earthquake. The first time was in response to a magnitude 5.9 quake in the north of Miyagi Prefecture on 27 November 1993. On that occasion reactor 1 tripped. Power increased rapidly, but the control rods inserted successfully. According to the manufacturer, the reason for the sudden increase in power was the shaking of the fuel assemblies. The second time was in response to a magnitude 7.1 quake off the Miyagi coast on 27 May 2003. On that occasion reactor 3 tripped. Reactors 1 and 2 were closed for periodic inspections at the time. An acceleration of 225 gal was recorded.

In this latest incident, besides cracked glass in an observation gallery in the reactor 3 building, 45 liters of sulfuric acid leaked from a tank on the roof of the environmental radioactivity measurement center building. As of September 2, checking of reactor 2 equipment was 30 percent complete, but no safety problems had been found. However, we are very concerned to know whether the control rods inserted within the specified time, what happened to the reactor pressure and the water level, whether cracks in the shroud and piping were affected, etc., etc..

Besides Onagawa, reactors at Higashidori, Fukushima I, Fukushima II, Kashiwazaki-Kariwa and Tokai were either already shutdown for one reason or another, or continued to operate. However, at Fukushima I - 2 & 6 and Fukushima II - 4 water leaked from spent fuel pools through vents and ducts into the containment vessel.

This time the quake exceeded the design basis for Onagawa NPP. The Japanese NPP design rules specify two classes of earthquake. The first class is the 'design-basis strongest earthquake'.

**Table 1: Threshold for Automatic Trip for Onagawa Nuclear Reactors**

Reactor 1	200 gal (horizontal, second floor basement )
	200 gal (horizontal, first floor)
	100 gal (vertical, first floor)
Reactor 2	200 gal (horizontal, third floor basement)
	400 gal (horizontal, first floor basement)
	100 gal (vertical, third floor basement)
Reactor 3	200 gal (horizontal, third floor basement)
	350 gal (horizontal, first floor basement)
	100 gal (vertical, third floor basement)

**Table 2: Size of Design-Basis Earthquakes for Onagawa Nuclear Reactors (from the applications for site approval)**

*Design-basis strongest earthquake (S1)*

Reactor 1	250 gal
Reactors 2&3	About 250 gal, 20.1 cm/s (kine)

*Design-basis upper limit earthquake (S2)*

Reactor 1	375 gal
Reactors 2&3	Below 350 gal, 26.6 cm/s (kine)
	Below 400 gal, 13.5 cm/s (kine) for a quake directly below NPP

This is hypothesized based on earthquakes which have occurred at active faults within the past 10,000 years. The second class is the 'design-basis upper limit earthquake'. This is hypothesized based either on earthquakes which have occurred at active faults within the past 50,000 years, or on a magnitude 6.5 earthquake directly below the NPP. Simply stated, from the standpoint of NPP designers, the 'design-basis strongest earthquake' is the largest earthquake that might realistically be expected to occur, whereas the 'design-basis upper limit earthquake' is unlikely to occur, but is taken into account just in case. Table 2 shows the anticipated quake size listed in the site applications for the three Onagawa reactors for each of these types of earthquake.

On August 16th, a maximum of 251.2 gal was recorded at the base (second floor basement) of the Onagawa-1 reactor. This exceeds the maximum acceleration of the 'design-basis strongest earthquake'. However, subsequent analysis of data from the bedrock showed that for some periods of the response spectrum, the movement exceeded the 'design-basis upper limit earthquake'. This was revealed in an announcement

made by Tohoku Electric on September 2nd. On the same day, the Nuclear Industrial and Safety Agency (NISA) said that it took this matter very seriously and requested that Tohoku Electric provide a detailed analysis of the capacity of safety-significant equipment to withstand earthquakes. It also requested an analysis of the reason why the response spectrum for the surface of the bedrock exceeded the response spectrum for the 'design-basis upper limit earthquake'. However, the fact that these design basis limits have been exceeded shows that the utilities and NPP makers design assumptions are inadequate. It also exposes a serious failure of the government's safety assessment system.

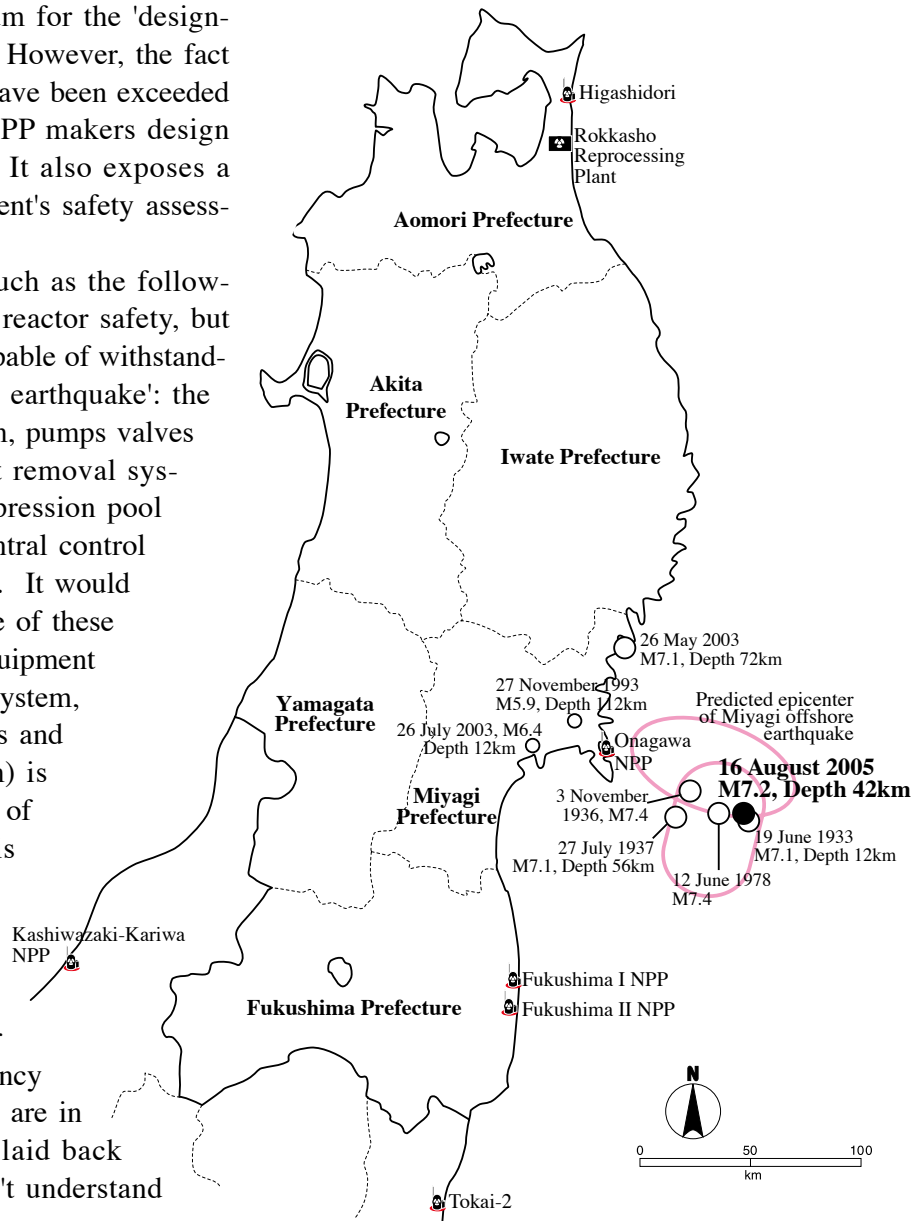
Facilities and equipment such as the following are all very important for reactor safety, but they are only required to be capable of withstanding the 'design-basis strongest earthquake': the emergency core cooling system, pumps valves and pipes of the residual heat removal system, the core shroud, the suppression pool as a source of coolant, the central control room, and the reactor building. It would not be at all surprising if some of these have been damaged. Other equipment (for example, the main steam system, the turbines, and pumps valves and pipes of the feedwater system) is not even required to be capable of withstanding the 'design-basis strongest earthquake'.

Tohoku Electric's response to this was, "We plan to restart the reactors after confirming that the reactor containment vessel, the emergency core cooling system and so on are in sound working order." This laid back approach shows that they don't understand

the seriousness of the problem. A major design defect of the reactors at the Onagawa NPP has been exposed. NISA should revoke their operating licenses.

Chihiro Kamisawa (CNIC)

1. 1 gal = 1 cm/s<sup>2</sup>



**Haiku for the Season**

*humid summer night  
the moon in the water  
reflection and cool breeze*

by Toshiko Hattori

**Congratulations:** Congratulations to Hiromitsu Toyosaki, the subject of the Who's Who column in NIT 107. He received a journalists' award for the book introduced in that column, *Marshall Islands: Nuclear Century*.

## Government approves Kyushu Electric's pluthermal plan

On September 7th the Minister of Economy Trade and Industry approved Kyushu Electric Power Company's pluthermal plan for Genkai-3. This followed favorable reports by the Nuclear Safety Commission (NSC) on 29 August and by the Atomic Energy Commission (AEC) the following day. The NSC and AEC reviews were double checks of an earlier investigation by the Ministry of Economy Trade and Industry (METI). They bring to an end the government's examination of Kyushu Electric's pluthermal plan. The final hurdle is the 'prior understanding' of the prefectural and local governments.

Japan's pluthermal plan was published by the Federation of Electric Power Companies (FEPCO) in February 1997 at the request of the central government. This request was made in consideration of the serious setback to the fast breeder reactor (FBR) program following the accident at the Monju FBR in 1995. The FEPCO plan was to fabricate the plutonium extracted from spent nuclear fuel into MOX fuel. Japanese power companies have contracts with reprocessing companies in France and the UK to reprocess their spent fuel. The MOX fuel would be fabricated in France and the UK, shipped to Japan and loaded into 16-18 reactors over the period from 1999 to 2010. The amount to be consumed by each power company was based on the amount specified in their contracts and Tokyo and Kansai Electric Power Companies (TEPCO and KEPCO) were to be the first to load MOX fuel. They were to load it from 1999, followed by the other companies early in the decade beginning in 2000. However, to date not a single reactor has introduced pluthermal.

MOX fuel for TEPCO was sent to Fukushima and Niigata and MOX fuel for KEPCO was sent to Fukui. However, in the KEPCO case it was discovered that the UK manufacturer (BNFL) had falsified quality control data. This was a major setback for the pluthermal plan. In 2002, this MOX fuel was returned to the UK without being loaded into reactors. After that, negotiations were commenced with France's COGEMA for a contract to manufacturer MOX fuel. However, in August 2004, when the negotiations had only proceeded to the stage of a provisional contract, a pipe ruptured

at the Mihama-3 reactor killing five people. As a result, KEPCO's quality control ability was called into question and the contract was not finalized.

In the case of TEPCO, in 2001 a citizens' referendum was held in Kariwa Village, Niigata Prefecture about the pluthermal plan and the majority voted against. (Kariwa Village hosts TEPCO's Kashiwazaiki-Kariwa NPP.) Then in August 2002, it was discovered that data from periodic inspections at TEPCO's NPPs had been altered and Niigata and Fukushima Prefectures both rescinded their 'prior understanding' for pluthermal.

With the two leading power companies' pluthermal plans derailed and the Rokkasho Reprocessing Plant scheduled to begin active trials (using spent fuel) in December, Kyushu Electric and Shikoku Electric were under pressure to submit applications for permission to use MOX fuel, in order to be able to show some progress in the pluthermal program. They plan to introduce pluthermal by 2010, while the Rokkasho Reprocessing Plant is scheduled to begin operations in 2007, so it's a tight schedule. In addition, to induce local and prefectural governments to accept pluthermal, in 2004 METI introduced new subsidies. Apparently consideration is being given to further raising these subsidies.

For its safety review of Genkai-3, NSC decided not to set up an expert review panel to conduct a detailed investigation. Instead it left the judgment to three of its commissioners. NSC said that it was unnecessary to conduct an expert investigation, because the use of MOX fuel in Genkai-3 would be the same as that previously intended for KEPCO's Takahama-3&4 reactors. However, the power output of Genkai-3 is higher at 1180 MW (Takahama 3&4 are 870 MW) and the core design is different, so 151 groups and 114 individuals demanded a rigorous expert investigation and an opportunity for public comment. They also pointed out that compared to overseas, the plutonium content would be quite high. Compared to 3.1-4.6% plutonium in France MOX fuel assemblies, Genkai-3 assemblies will contain 6.1%. As a result, the plutonium could become unevenly distributed (plutonium spots), increasing the risk of damage to the fuel. There is also concern that there is nowhere to put the spent MOX fuel and that it may *Continued on page 12*



# Workers' radiation exposure at Japan's nuclear power plants

(April 2004 - March 2005)

In July, the Nuclear and Industrial Safety Agency (NISA) released data relating to worker radiation exposure and the management of radioactive waste at nuclear facilities for the 2004 fiscal year. The data covers nuclear power reactors, nuclear fuel related facilities and radioactive waste facilities.

During this period, trial operations commenced at Tohoku Electric Power Company's Higashidori reactor (BWR 1,100 MW). The collective dose at nuclear power plants (NPP) was 78.23 person-sieverts. This was lower than the previous year's figure of 96.87 person-sieverts. This was because in 2003 there were lots of problems at boiling water reactors. However, the exposure at pressurized water reactors actually increased by 4.26 person-sieverts in 2004.

All 402 people who received doses in the 15-20 milli-sievert range were sub-contractor workers. The highest dose was 19.4 milli-sieverts at Fukushima I. By contrast, figures published by the Radiation Dose Registration Center (part of the Radiation Effects Association) are much higher. This is because these figures take into account the fact that some people worked at more than one nuclear power plant. According to these figures, 776 people received

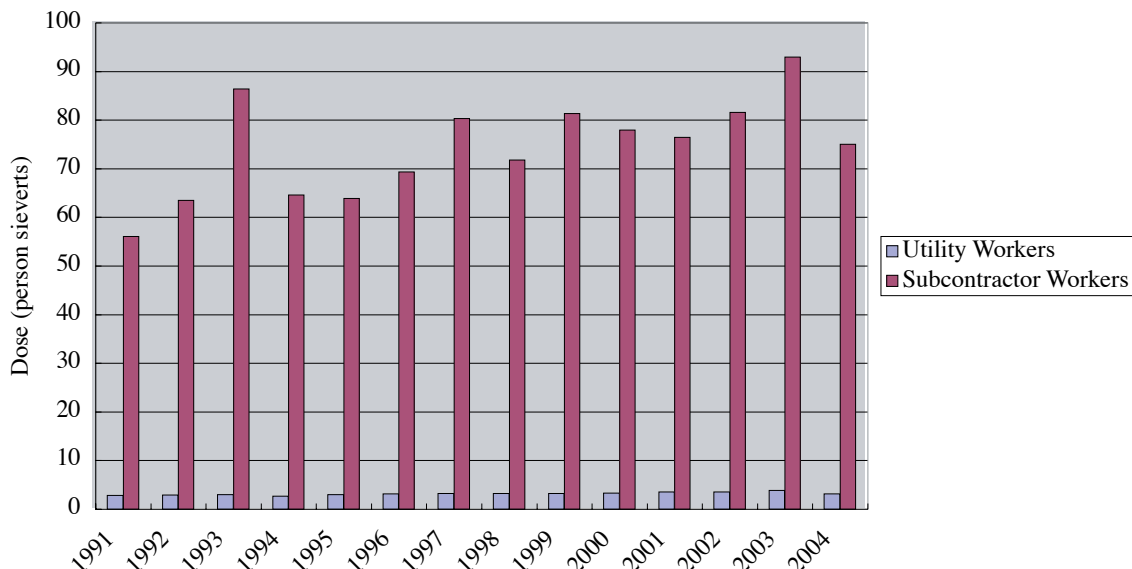
doses in the 15-20 milli-sievert range and one person received a dose in the 20-25 milli-sievert range.

Subcontractor workers received 96% of the total dose. The highest dose to a power company employee was 10.7 milli-sieverts. This was at the Sendai NPP in Kyushu.

It was pointed out at the April 2002 Conference of Contracting Parties to the Convention on Nuclear Safety that worker exposure in Japan was the highest in the world. In August 2004 NISA published Japan's National Report for the Conference of Parties held in April 2005. This report was expected to include comments on improvements made so far. In fact, the basic position presented in the report is that exposure is "well within the prescribed dose limit". The only specific proposal for reducing collective dose for workers is through the introduction of "Rules on Fitness-for-Service". In simple language, this means that by relaxing the requirement to repair defects the amount of high-exposure work will be reduced. It would appear that the only idea NISA has to reduce worker exposure is to reduce reactor safety requirements.

Mikiko Watanabe (CNIC)

Worker Exposure at Japanese Nuclear Power Plants 1991-2004



**Group Introduction:**

**Iwate Committee to Protect the Sanriku Sea from Radiation**

by Fumio Nagata

**W**e are an Iwate Prefecture citizens' group opposed to the operation of the Rokkasho Reprocessing Plant in Aomori Prefecture. We are concerned about the ocean being polluted with radioactive liquid waste from the plant.

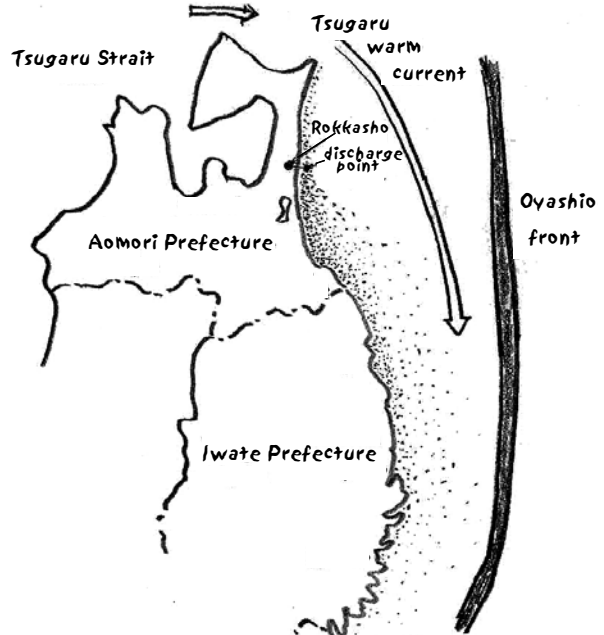
As shown on the map, Iwate Prefecture is located south of Aomori Prefecture. It has been discovered that radioactive elements will be carried by the Tsugaru warm current down the Sanriku Coast of Iwate Prefecture, pushed south by the cold Oyashio front from the north. Just off the Sanriku Coast is one of the world's three best fishing grounds. Along the coast large quantities of

**Liquid Releases to Sea**  
(from JNFL's Rokkasho Reprocessing Plant operating license application (OLA).)

Radioactive Isotope	OLA Bq/year
H-3	1.80E+16
Co-60	4.10E+09
Sr-90	1.20E+10
Y-90	1.20E+10
Ru-106	2.40E+10
Rh-106	2.40E+10
I-129	4.30E+10
I-131	1.70E+11
Cs-134	8.20E+09
Cs-137	1.60E+10
Ba-137m	1.60E+10
Ce-144	4.90E+09
Pr-144m	5.90E+07
Pr-144	4.90E+09
Eu-154	1.40E+09
Pu-240	3.00E+09
Pu-241	8.00E+10
Am-241	1.40E+08
Cm-244	3.90E+08

sea food are cultivated, including abalone, sea urchin, scallops, wakame seaweed and ascidian. Japanese eat a lot of sea food and this is the supply base. Large quantities of radioactive isotopes, including tritium, iodine 129 and 131, strontium 90 and plutonium 240 will come flowing down into this abundant fishing ground (see table).

We kicked off our campaign against reprocessing with a public meeting in May. We invited Honorary Professor Mizuguchi of Tokyo University University of Marine Science and Technology to speak and sent a list of questions to Japan Nuclear Fuel Ltd. (JNFL). JNFL responded that the radioactivity will have no effect on humans because it will be diluted by the sea water and that an environmental assessment for the Sanriku Coast is unnecessary. At the moment we are running a petition demanding that they "should not proceed with reprocessing until the understanding of Iwate Prefecture's coastal residents has been



obtained." We plan to use this to put pressure on the Governor and Parliament of Iwate Prefecture.

We also held meetings with Professor Mizuguchi at the beginning of September in three districts on the Sanriku Coast. We hope to find out the truth about environmental pollution resulting from reprocessing and, in particular, hope for a groundswell against reprocessing within the fishing industry. Our committee is based on groups campaigning on the problems associated with medical radioactive waste and groups campaigning on food safety, peace and environmental issues.

When we heard of the radioactive pollution of the seas around the reprocessing plants in England and France and the frequent occurrence of childhood leukemia, we realized that tomorrow this could be us, so we decided to take action. We are campaigning with the conviction that by rousing public opinion in Iwate Prefecture we can shift Aomori Prefecture and stop reprocessing.



\* Fumio Nagata is a member of Iwate Committee to Protect the Sanriku Sea from Radiation.

# NEWS WATCH

## **Mitsubishi wins order from EDF**

Mitsubishi Heavy Industries (MHI) announced on August 24 that it had won an order for six steam generators (SGs) for two PWR reactors from Electricite de France (EDF). Previously, EDF had placed orders for all major nuclear equipment with FRAMATOME. However, EU demanded the liberalization of the French market, so for the first time EDF decided to place an order overseas. Fifteen replacement SGs for five reactors were put out for international bidding and FRAMATOME won orders for nine SGs for three reactors. In addition, Westinghouse Electric Corporation of the United States made a bid for the SGs. The actual manufacturing would have been commissioned to Doosan Heavy Industries & Construction Co., Ltd. of South Korea.

Using this order as a springboard, MHI hopes to expand its business into maintenance work for French nuclear plants and other replacement equipment.

## **Will development of next generation reactors be led by manufacturers?**

During its August 9 meeting, the Nuclear Power Sub-committee of the Advisory Committee for Natural Resources and Energy approved a new policy for the development of next generation light-water reactors. Hitherto, development has been carried out by the government, hand-in-hand with the private sector, but from the next fiscal year manufacturers will be asked to take the lead. Until now, electric power companies led the initiative, but it has become difficult for power companies to lead large projects, due to deregulation and sluggish demand for electric power.

However, these same reasons make us wonder whether power companies will buy the next generation reactors that are developed. The manufacturers also are getting cold feet and the future prospects for the development appear dim.

## **Tokai Reprocessing Plant to be dismantled in 5 years**

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) has been formulating medium-term goals for the period after the integration of Japan Nuclear Cycle Development Institute (JNC) and Japan Atomic Energy Research Institute (JAERI). A controversial proposal would see the Tokai Reprocessing Plant dismantled in five years.

MEXT stated that the content of the proposal could not be disclosed, as it was still under discussion. However, it was reported as comments of some officials involved by the *Denki Shim-bun* (Electricity News) on August 15. The Tokai Reprocessing Plant's contracts for reprocessing spent fuel produced at commercial reactors have already been completed and only spent fuel from JNC's Fugen (an advanced thermal reactor which ceased operations in March 2003) remains to be done. MEXT wants to dismantle the Tokai plant in FY2010, when reprocessing of Fugen's spent fuel has been completed. However, electric power companies, which want the government to do research and development into the reprocessing of irradiated MOX fuel, and JNC, which wants to carry out this research, are opposed to the proposal.

## **Mihama-3 accident: one year on**

One year has passed since the accident at Kansai Electric Power Company's, (KEPCO) Mihama-3 reactor (PWR, 826 MW). The accident, in which five people were killed and six suffered serious burns, occurred on 9 August 2004 (NIT 102). Of the six with burns, one has returned to work, three have begun clerical work while continuing to visit the hospital as outpatients, one is recuperating at home and one still remains in hospital. Aiming to resume operations, on August 4 KEPCO submitted a written plan to Fukui Prefecture, Mihama Town and the Nuclear and Industrial

Safety Agency for the replacement of the ruptured pipe. Work began on the 8th.

Fukui Prefectural Police Headquarters has been investigating criminal liability for the accident. Naoomi Nakayama, chief of criminal investigations, stated that they "would continue investigations, including into the nature of KEPCO, which lies behind this accident", and that they "would like to establish a criminal case as soon as possible". It seems, however, that it will still take some time.

**Modification work begins at Monju**

On September 1, the Japan Nuclear Cycle Development Institute (JNC) began modification work at its Monju prototype fast breeder reactor (280 MW) in Tsuruga City, Fukui Prefecture. With regard to the thermocouples which caused the sodium leakage from the secondary cooling system in 1995, 6 out of 48 were considered to be unnecessary and will be removed. The remaining 42 will be replaced with improved ones. As a protection against sodium leakage from the primary coolant system, an electric-powered motor will be installed to enable valves to be operated by remote control, in order to swiftly recover leaked sodium. So that the sodium in the secondary cooling system can be drained out, a drain pipe will be added.

According to JNC's plan, testing of these modifications will begin by the end of 2006. Tests to check the plant as a whole will be carried out in the middle of 2007 and Monju is scheduled to recommence operations at the beginning of 2008. However, since sodium is still flowing in the A loop of the primary system, the work has to be done in an environment of nitrogen gas. JNC says, "it will be more difficult than building a new one", so the possibility of an accident occurring during the modification work cannot be ruled out.

*Continued from page 8* be stored long-term at the reactor site. This is because even if the Rokkasho Reprocessing Plant starts up, it is not capable of reprocessing MOX fuel.

In Kysushu there has been a wide range of activities in opposition to pluthermal, including protest flotillas on the sea around Genkai, petitions and public debates. Also, resolutions against pluthermal have been passed by local councils neighboring Genkai. Now that the government has approved pluthermal for Genkai-3, it is very important to have a strong follow-up to the protests carried out so far.

Hideyuki Ban (CNIC Co-Director)

**Post Script**

On September 12th and 13th respectively, Chugoku Electric and Chubu Electric informed their prefectural and local governments of their intention to introduce pluthermal by 2010. The next step will be for them to submit a formal application for approval to the central government.

Clearly these moves are an attempt to justify the impending commencement of active trials at Rokkasho. It is highly likely that the same imperative will also induce Tohoku Electric, Hokuriku Electric and Hokkaido Electric to announce pluthermal plans in the near future.

Meanwhile, there is strong local opposition to pluthermal at Chubu Electric's Hamaoka plant, because it is in a major earthquake zone.

- 1. The term 'pluthermal' refers to the use of plutonium in the form of 'mixed oxide' (MOX) fuel in light water reactors.

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Proof Readers: Tony Boys, Tony Moore, Yukio Yamaguchi, Baku Nishio, Philip White  
Editor: Philip White