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Reactor Pressure Vessel Exported to Taiwan

Protest boat at Yokohama with the Happy Buccaneer in the background. (Photo by Akira Imai)

On July 2nd a ship carrying a reactor pressure vessel left the Port of Yokohama in Kanagawa Prefecture for Taiwan. The pressure vessel is destined for use at the second reactor of Taiwan's No. 4 Nuclear Power Plant (Lungmen-1&2, ABWR, each 1,350 MW).

Taiwan Power Co. chose General Electric Co. as the prime contractor, which ordered the reactor pressure vessel from Toshiba Corp.. Toshiba, in turn, subcontracted the manufacture to Ishikawajima-Harima Heavy Industries Co. Ltd. (IHI). GE had previously ordered the reactor pressure vessel for the first reactor from Hitachi, which subcontracted the construction to Babcock Hitachi. That was sent to Lungmen in June 2003.

The Advanced Boiling Water Reactor (ABWR) was developed jointly by Tokyo Electric Power Company, GE, Toshiba and Hitachi. Within Japan it is operational at Kashiwazaki-

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Kariwa-6&7, undergoing trials at Hamaoka-5 and under construction at Shiga-2. Outside Japan, Taiwan's Lungmen-1&2 are the only reactors built to this design. The prime contractor is GE, but it is fair to say that this is the first real Japanese export of a nuclear reactor. The contract for the turbine was won by Mitsubishi Heavy Industries (MHI).

It is not, however, the first case of a Japanese manufacturer exporting a reactor pressure vessel. Since 1971, when Toshiba won the contract for the reactor pressure vessels for Browns Ferry-2&3, Toshiba, Hitachi and MHI have each exported reactor pressure vessels. However, in each case the reactor pressure vessel was exported on its own as a component. Various types of component exports have been undertaken, ranging from reactor containment vessels, steam generators and core internals to valves, but no Japanese manufacturer has ever been selected as the prime contractor.

This time, too, strictly speaking, it is a component export, but unlike the previous examples, in this case Japan played a central role in the development of the reactor and in that sense it can be said to be a first. Japanese manufacturers are now hoping to launch into full-scale exports to other Asian countries, for example to China and Vietnam. Stopping this is a major issue for the Japanese anti-nuclear movement. In this regard, note the following comment in a June 24th, International Atomic Energy Agency (IAEA) press release: "Eighteen of the 27 nuclear power plants now under construction are in Asia. Twenty-two of the last 31 new nuclear power plants to start up were in Asia as well."

Following the first No Nukes Asia Forum (held in Japan in June 1993), the No Nukes Asia Forum Japan was formed (refer NIT No. 38, Nov/Dec 1993). This group joined forces with anti-nuclear energy groups throughout Asia in an effort to prevent Japan from exporting nuclear reactors. It helps activists from around Asia to come together once a year in various locations. There people exchange information and organize symposiums about nuclear power and renewable energy. CNIC also participates in these meetings, providing information about such things as the situation regarding nuclear power in Japan. In regard to Lungmen, since Kashiwazaki-Kariwa is the only place where that type of reactor is operational, information from people from the local Kashiwazaki-Kariwa anti-nuclear movement who have attended these meetings has been extremely valuable.

It was this forum which called for protests against this particular shipment. In response, on July 1st a protest involving 25 activists unfolded on land and sea. The protest was planned for this day because it was the day that the ship was scheduled to depart. In the end, however, the ship's departure was delayed to the following morning due to a typhoon.

Construction of Taiwan's Lungmen Power Plant is more than 50% complete. The reactor pressure vessel delivered a year ago is currently in storage, not having been installed at this stage. The reactor pressure vessel for the second reactor will also go into storage. Taiwan Power's plan is to install the first reactor pressure vessel at the end of this year and the second one in the middle of next year. A referendum to approve or reject construction of this power plant has been postponed, but is now scheduled to occur in December.

The question of what can be done to prevent Japan from exporting nuclear reactors and components is therefore a difficult one. I am inclined to think that the most effective approach will be to accurately communicate the true situation in regard to nuclear and other forms of energy in Japan. In any case, the No Nukes Asia Forum has an important role to play and CNIC will continue to provide information to support the movement against nuclear energy in Asia.

by Baku Nishio (CNIC)

Please note that CNIC's email address has changed. Our new address is as follows: **<cnic@nifty.com>**

Rokkasho Reprocessing Plant Update

Repair work on leaks and faulty welding at the Rokkasho Reprocessing Plant (RRP) currently under construction was completed in February this year. Leaks in the spent fuel storage pool were found in six places. Faulty welds where leaks could possibly occur were found in another 285 places. There have been many problems at the plant and now the Atomic Energy Commission (AEC) has begun discussions about what to do about the nuclear fuel cycle. At the center of this issue is the policy about the Rokkasho plant. The discussions will bring into focus the future direction of Japan's nuclear energy policy.

Problems with criticality control software

Chemical trials in the main buildings were completed at the end of December 2003. The results of these trials were announced in January 2004. Altogether 307 problems were identified. Of particular importance were defects in the computer software that controls the many valves used to prevent criticality accidents. When solutions containing uranium and plutonium are transported between buildings at RRP, the concentration of the solutions is calculated in the Analysis Laboratory Building. The results of these calculations are then confirmed in the Central Control Building, before the valves are opened to allow the liquid to be transferred from one building to another. However in September 2003 problems arose in the criticality control software, such that data could not be passed between the Analysis Laboratory Building, the Central Control Building and the other buidings. The main reason is believed to be that the units for measuring the concentrations of the solutions were different for each software package. Such a basic design error exposed once again the sloppiness of Japan Nuclear Fuels Ltd's (JNFL) quality control.

A further problem is the fact that because JNFL is in a hurry to make the plant operational it intends to carry out uranium trials before the problems with the software are rectified. The Nuclear and Industrial Safety Agency (NISA) has agreed to this. Both of these organizations state that because depleted uranium will be used during the uranium tests, there is no possibility that a criticality accident will occur. They argue that the software can be fixed while the tests are being carried out. The next step is to run a solution of plutonium through the plant. We are protesting against these two organizations' plan to ignore safety considerations and forge ahead with the tests.

Commencement of operations should be postponed

Now that the chemical trials have been completed, in order to proceed to the next step (the uranium trials) it is necessary to get NISA's approval of the results of the chemical trials, then get approval for 'Regulations Regarding the Conduct and Safety of Uranium Tests'. Further, JNFL must conclude a 'Local Safety and Environmental Protection Agreement' with the regional and local governments: Aomori Prefecture, Rokkasho Village and the thirteen surrounding towns and villages. At this stage, (late July) NISA has given its approval, but JNFL has run into problems with the local governments. Due to the fact that the uranium tests have been delayed, JNFL has been under pressure to postpone the testing schedule and the commencement of operations. At the end of June JNFL postponed the date for the commencement of uranium tests to July and postponed the date for the 'active tests' one month from June 2005 to July. It is trying to fool people with these short postponements.

In fact, there is no chance that the uranium tests will commence this month (July). Even if all arrangements went according to plan from now on, the earliest the tests could start is the end of September. What this really means is that the scheduled date for the commencement

of operations at the facility (July 2006) will be postponed. Everyone knows this, but JNFL is avoiding making the announcement. Furthermore, in June AEC began its five yearly review of the Long-Term Nuclear Program (see page 5). The RRP plan is the biggest issue in these discussions. The total cost of RRP is estimated at 11 billion yen. Add to this the 'backend costs' and you come up with a total cost of 19 billion yen (see NIT 98 p. 10). It is clear that the costs of the nuclear fuel cycle will become a huge burden for the general public and the need to reconsider the nuclear fuel cycle policy has emerged as a political issue.

JNFL's custody of nuclear materials

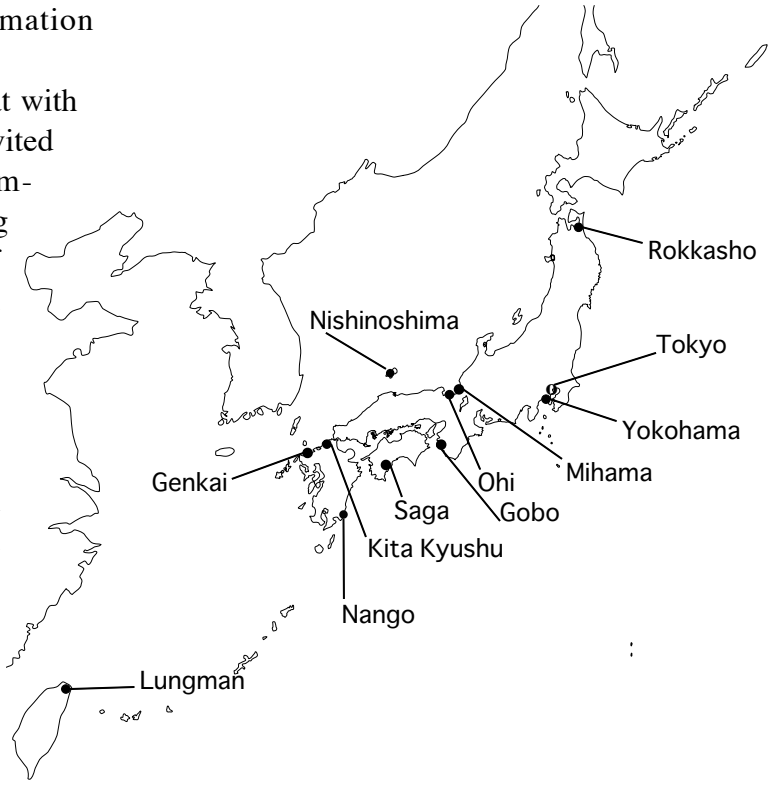
The government and JNFL have taken the position that the principal manufacturing processes at RRP are classified information, because these processes relate to the custody of nuclear materials. In the context of the legal proceedings relating to the licence approval, they have consistently claimed that they can't permit an inspection of the facility. Furthermore, the technology involved in the principal manufacturing processes was imported from COGEMA. They argue that under the Japan France Nuclear Agreement this information cannot be published.

However, it was revealed in June that with the uranium tests approaching JNFL invited the national media into the Uranium-Plutonium Co-denitration Building and allowed them to take photos of the equipment - this after having said that they were unable to allow public access to this area. The citizens who are complainants in the above court case demanded that the government withdraw the explanation that it has given so far. At the same time they demanded that the Aomori District Court conduct an inspection of the building. Immediately the court accepted the citizens' demand and the equipment will be inspected on July 30th. This incident starkly illustrates the fact that the government applies this 'confidentiality of the custody of nuclear materials' in a totally arbitrary fashion. The claims made by the government and JNFL on this matter are in total conflict. JNFL says that the areas which are open to the public "were decided in consultation with the government." For its part, the government says that JNFL broke the law (Regulation of Nuclear Reactors and Related Matters Act). However, the government is worried that the problem could get out of hand, so on June 24th it delivered a 'severe reprimand' to JNFL, thus shifting all the blame onto JNFL. Such is the quality of JNFL's and the Japanese Government's notion of custody of nuclear materials. This sad reality was brought into sharp relief as a result of the inspection issue.

by Masako Sawai, (CNIC)

Where's that place?

(Map showing places mentioned in this issue of NIT)



I Join the 'Long-Term Program'

Recently I agreed to become a member of the government's Long-Term Program for Research, Development, and Utilization of Nuclear Energy (Long-Term Program). I joined at the request of the secretariat of the Japan Atomic Energy Commission (AEC) and I hope to use my new position as a platform to speak out against Japan's nuclear power development strategy. Although I am the only member of the Long-Term Program from an anti-nuclear organization, I am also the first, a fact that reflects growing public disenchantment with Japan's nuclear energy policy.

The Long-Term Program was drafted in 1956 and has been revised every five-to-seven years since. This will be the tenth revision of the plan. Until 2000, the program set power output goals (for instance, by 2030, the objective was pegged at 100 million kW), but since 2000 companies have been left to develop their own goals. Nonetheless, reprocessing and work on fast-breeder reactors still remains a national responsibility.

The Long-Term Program has been implemented by people referred to collectively as the nuclear power lobby (in Japanese, literally, "nuclear power village"). In other words, the government has used national research funds to finance research and development within the framework of the plan, but has not funded related projects outside that framework. As a result, the Long-Term Program has become a de facto lobby for interest groups working in nuclear-related industries. By adding an anti-nuclear activist to its membership, the Long-Term Program has made a major concession to nuclear power foes. Of course, the Program will probably continue in its role as the distributor of benefits, but with the most recent revision, the Program itself has assumed a new importance. It will decide the fate of Japan's nuclear fuel cycle policy.

Cartoon by Shoji Takagi

In the context of the nuclear fuel cycle, media reports indicate that the focus of the current revision to the Long-Term Program will be the national reprocessing policy. Since 2000, the debate on spent-fuel reprocessing has changed dramatically, as evidenced in three recent developments. First, construction costs for the Rokkasho Reprocessing Plant in Aomori Prefecture have soared and are now expected to exceed 2.14 trillion yen. Next, even some nuclear power advocates believe that reprocessing is not necessary at the present time. Finally, a group spearheaded by young Diet members of the ruling Liberal Democratic Party has begun expressing doubts about the wisdom of reprocessing. Long-Term Program Chair Shunsuke Kondo has recently announced that the Program will undertake a comparison of the costs involved in reprocessing and in 'once-through'(1) technology.

To date, the Long-Term Program has already convened twice. Just before the second meeting, it was revealed that the Ministry of Economy, Trade, and Industry (METI); the Federation of Electrical Power Companies, Japan; and the AEC had hidden the fact that they had conducted cost surveys for once-through technology. In fact, they had carried out such studies between 1994 and 1998. METI actually perjured itself in testimony before the National Diet saying, "No such calculation has been made for Japan." As a result, these organizations are scheduled to make their cost estimates public. Moreover, the Atomic Energy Commission is apparently conducting its own up-to-date cost survey. Construction of the Rokkasho Reprocessing Plan is now 95% completed. Will the facility begin reprocessing spent nuclear fuel, or will it be shut down for good? That question will be debated by the Long-Term Program in the coming months.

by Hideyuki Ban, Co-Director, CNIC

(1) 'Once through' refers to direct disposal of spent fuel, without reprocessing it to extract the plutonium, etc..

Significant Incidents at Nuclear Power Plants and Nuclear Fuel Facilities (Jan. 2003 - Dec. 2003)

DATE	*Operator*	*Facility Name*	*Type*	*Short Description of Incidents*
Feb. 7	JNFL (Japan Nuclear Fuel Limited)	Rokkasho Reprocessing Plant	Reprocessing Plant	Leak detected at fuel assembly transfer pit
Feb. 12	Kansai-EPCO	Takahama-1	Pressurized Water Reactor (PWR)	During periodic inpection crack found at neutron flux monitor nozzle (made of Inconel 600) mounted to reactor vessel bottom
Feb. 18	Shikoku-EPCO	Ikata-1	PWR	Leak detected at chemical volume control tank outlet piping
Feb. 27	JAPC (Japan Atomic Power Company)	Tsuruga-1	Boiling Water Reactor (BWR)	Reactor manually shut down due to leak detected at mechanical seals of recirculation pumps (B and C)
Feb. 27	Tokyo-EPCO	Kashiwazaki-Kariwa-3	BWR	Cracks found at welds of primary loop recirculation system piping (made of SUS316L) during planned stoppage
Feb. 28	Tokyo-EPCO	Fukushima I-3	BWR	Control rod interlock cancelation found at "one control rod draw check" during periodic inspection
March 4	**Tokyo-EPCO**	**Fukushima I-3**	**BWR**	**A control rod insertion delayed at "control rod insertion/draw examination" during periodic inspection**
March 5	**Tokyo-EPCO**	**Fukushima II-1**	**BWR**	**Foreign metal material found at the top of a nuclear fuel assembly during periodic inspection**
March 10	Chubu-EPCO	Hamaoka-3	BWR	Cracks found at welds of core shroud (made of SUS316L) middle and lower region during periodic inspection; cracks found at inside surface of H4 position, at outside surface of H6a position, at inside surface of H7 position, etc.
March 27	Tokyo-EPCO	Kashiwazaki-Kariwa-4	BWR	Cracks found at 6 welds of primary loop recirculation system piping (made of SUS316L) during periodic inspection
April 16	Tokyo-EPCO	Fukushima II-1	BWR	Cracks found at a weld between reactor pressure vessel nozzle safe-end pipe (made of SUS316L) and primary loop recirculation system piping (made of SUS304L) during periodic inspection
April 17	Chubu-EPCO	Hamaoka-3	BWR	Cracks found at welds of primary loop recirculation system piping (made of SUS316L) during periodic inspection
April 17	Chubu-EPCO	Hamaoka-4	BWR	Cracks found at welds of primary loop recirculation system piping (made of SUS316L) during periodic inspection
April 29	Chugoku-EPCO	Shimane-2	BWR	Cracks found at welds of core shroud (made of SUS316L) middle region during periodic inspection; cracks found at inside surface of H4 position
May 8	Kansai-EPCO	Mihama-2	PWR	Generator power reduced due to leak at 5th high pressure feed water heater
May 12	Tokyo-EPCO	Kashiwazaki-Kariwa-5	BWR	Cracks found at welds of primary loop recirculation system piping (made of SUS316L) during periodic inspection
May 15	**Kyushu-EPCO**	**Sendai-1**	**PWR**	**Damage to 15 steam generator tubes during periodic inspection**
May 20	Tokyo-EPCO	Kashiwazaki-Kariwa-5	BWR	Cracks found at welds of core shroud (made of SUS316L) middle region during periodic inspection; cracks found at inside surface of H4 position and of V14 position
May 21	Kansai-EPCO	Mihama-3	PWR	Cracks found at reactor vessel bottom mounted conduit tube during periodic inspection
May 22	**Kansai-EPCO**	**Takahama-4**	**PWR**	**Damage to 2 steam generator tubes during periodic inspection**
May 26	Tohoku-EPCO	Onagawa-3	BWR	Reactor automatically shutdown due to "large ground acceleration" signal set off by an earthquake (magnitude 7.0)
May 28	Tokyo-EPCO	Fukushima II-3	BWR	Cracks found at guide roller installed area of a control rod handle during periodic inspection
June 9	Tohoku-EPCO	Onagawa-2	BWR	Cracks found at welds of core shroud (made of SUS316L) middle region and lower region during periodic inspection; cracks found at outside surface of H3 position and at inside surface of H7a position
June 10	Chubu-EPCO	Hamaoka-1	BWR	Cracks found at a weld of core shroud (made of SUS304) lower region during periodic inspection; cracks found at inside surface of H7b position
June 14	Tokyo-EPCO	Fukushima II-3	BWR	Fuel assemblies installation operation stopped due to lack of a control rod at a fuel cell during periodic inspection
June 16	Chubu-EPCO	Hamaoka-1	BWR	Cracks found at upper region of a weld of the core shroud (made of SUS304) during periodic inspection; crack found near upper lattice plate base
June 23	Tohoku-EPCO	Onagawa-2	BWR	Cracks found at a weld of primary loop recirculation system piping (made of SUS316L) during periodic inspection
June 24	JAPC	Tsuruga-1	BWR	Cracks found at surface of control rod blades during periodic inspection
July 4	JNC (Japan Nuclear Cycle Development Institute)	Fugen	Advanced Thermal Reactor	Fire alarm set off at waste treatment building; window of low-level radioactive waste incinerator broken due to explosion and 460 million bequerels of radioactive ash leaked

Significant Incidents at Nuclear Power Plants and Nuclear Fuel Facilities (Jan. 2003 - Dec. 2003) continued

DATE	*Operator*	*Facility Name*	*Type*	*Short Description of Incidents*
July 8	**JNC**	**Joyo**	**Experimental Fast Reactor**	**Reactor automatically shut down due to "neutron flux high" signal**
July 15	Tokyo-EPCO	Fukushima II-2	BWR	Cracks found at welds of primary loop recirculation system piping (made of SUS316L) during periodic inspection
July 24	Tokyo-EPCO	Fukushima I-2	BWR	Leak found at instrumentation outlet of residue heat removal system during periodic inspection
July 29	Hokuriku-EPCO	Shika-1	BWR	Cracks found at welds of primary loop recirculation system piping (made of SUS316L) during periodic inspection (also on Aug. 26 and on Sep. 3)
July 31	Tokyo-EPCO	Fukushima II-2	BWR	Cracks found at welds of core shroud (made of SUS316L) middle region during periodic inspaction; cracks found at outside surface of H4 position
Aug. 1	Tohoku-EPCO	Onagawa-2	BWR	Cracks found at welds of primary loop recirculation system piping (made of SUS316L) during periodic inspection
Sep. 7	**Hokkaido-EPCO**	**Tomari-2**	**PWR**	**Leak found at regenerated heat exchanger; reactor manually shut down for inspection on Sep. 11**
Sep. 10	**JAPC**	**Tsuruga-2**	**PWR**	**Build up of boric acid powder and cracks found at welds of pressurizer relief valve nozzle and of pressurizer safety valve nozzle during periodic inspection**
Oct. 6	Tohoku-EPCO	Onagawa-2	BWR	Leak detected at containment vessel sump; damage found at mechanical seals of recirculation inlet pump and of recirculation outlet pump during periodic inspection
Oct. 6	Tokyo-EPCO	Fukushima II-4	BWR	Cracks found at guide roller installed area of control rod handles and at surface of control rod blades during periodic inspection
Oct. 7	Tokyo-EPCO	Kashiwazaki-Kariwa-7	BWR	Cracks found at impellers of reactor internal pumps during periodic inspection
Oct. 9 - Nov. 7	Tokyo-EPCO	Fukushima I-1,2,3,4,6	BWR	Various foreign materials (scaffolding members, clamps, vinyl sheet chips, vinyl tape chips, ropes, spanner, pen, etc.) found in suppression chambers during periodic inspection
Oct. 14	Chugoku-EPCO	Shimane-1	BWR	Spacers slippage found at fuel assemblies during periodic inspection
Oct. 14 - Nov. 7	Tokyo-EPCO	Kashiwazaki-Kariwa-1,2,3,5,7	BWR	Various foreign materials (vinyl sheet chips, ropes, electromoved grinder, pliers, dust mask, video tape, boot, heat insulating materials, etc.) found in suppression chambers during periodic inspection
Oct. 16 - Nov. 7	Tokyo-EPCO	Fukushima II-1,2,3,4	BWR	Various foreign materials (vinyl sheet chips, vinyl tape chips, ropes, spanner, pen, etc.) found in suppression chambers during periodic inspection
Oct. 17	Shikoku-EPCO	Ikata-3	PWR	Emergency diesel generator activation failed at start-up operation
Oct. 22	Kansai-EPCO	Takahama-2	PWR	Reactor manually shut down due to steam leak from 3rd low-pressure turbine inlet flange during conditioning operation
Oct. 22	Tokyo-EPCO	Fukushima II-4	BWR	Crack found at weld of primary loop recirculation system piping (made of SUS316L) during periodic inspection
Nov. 5	Tokyo-EPCO	Kashiwazaki-Kariwa-2	BWR	One part of cleaning device fell into reactor vessel during core shroud cleaning test operation during periodic inspection
Nov. 6	Tohoku-EPCO	Onagawa-2	BWR	Various foreign materials (wire, vinyl sheet chips, vinyl tape chips, ropes, miniature lamp, etc.) found in suppression chambers during periodic inspection
Nov. 9	**Kansai-EPCO**	**Mihama-2**	**PWR**	**Reactor manually shut down due to primary coolant leak found at cap of bent line attached to pressurizer spray piping**
Nov. 18	Tokyo-EPCO	Fukushima I-6	BWR	One part of cleaning device fell into reactor vessel during control rod drive mechanism housing tub tube cleaning operation during periodic inspection
Nov. 19	Chubu-EPCO	Hamaoka-2	BWR	SCRAM signal set off accidentally due to ocsillation in value indicated by average power range monitor
Nov. 22	Chubu-EPCO	Hamaoka-1	BWR	One part of cleaning device fell into reactor vessel during core shroud support cylinder cleaning operation during periodic inspection
Nov. 25	Chubu-EPCO	Hamaoka-1	BWR	Cracks found at welds of core shroud support cylinder and of core shroud support legs during periodic inspection
Dec. 2	Chugoku-EPCO	Shimane-1	BWR	A worker exposed due to inhalation of 917 bequerels of cobalt-60 during containment vessel head installation operation
Dec. 5	**Kansai-EPCO**	**Ohi-1**	**PWR**	**Reactor manually shut down due to leak from mechanical seal of primary coolant pump**
Dec. 5	Tokyo-EPCO	Fukushima I-6	BWR	Leak found at water level gauge tube opening during periodic inspection
Dec. 18	Chubu-EPCO	Hamaoka-1	BWR	Cracks found at welds of jet pumps during periodic inspection
Dec. 19	JAPC	Tsuruga-1	BWR	Reactor automatically shut down due to lightning
Dec. 20	Tokyo-EPCO	Fukushima I-6	BWR	Stress reduction device stopped during operation to reduce stress on control rod drive mechanism housing stub tubes during periodic inspection
Dec. 26	JAPC	Tsuruga-1	BWR	Leak detected at mechanical seal of recirculation pump; reactor manually shut down on Dec. 28

Cracks in Reactor Vessel Head at Ohi-3

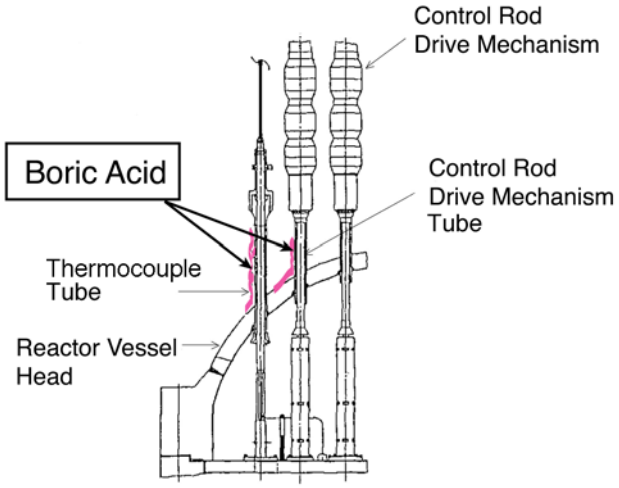
On May 4th, during routine inspections of Ohi-3 (Fukui Prefecture, Ohi Town, Pressurized Water Reactor (PWR), 1,180 MW), a build up of white powder was detected around the area where the control rod drive mechanisms attach to the reactor vessel head. The powder, which turned out to be boric acid, showed that water had leaked from the reactor. It seems likely that some type of damage, such as cracking, has occurred in a control rod drive mechanism tube. This is the first such case in Japan. At this stage the size, exact position and direction of the cracks are not known.

Evidence of cracking was found when preparing for external visual inspections of the 70 tubes (control rod mechanism and thermocouple tubes), which are welded to and penetrate the vessel head. Since stress corrosion cracking of Inconel alloy 600 (a nickel-based alloy also known as Inconel 600 or alloy 600) was found at Davis-Besse (US, reactor vessel head & control rod drive mechanisms), Tsuruga-2 (Japan, pressurizer relief valve tube) and numerous other reactors, Kansai Electric Power Company (KEPCO) has been worried that it might find similar cracks at its own power stations.

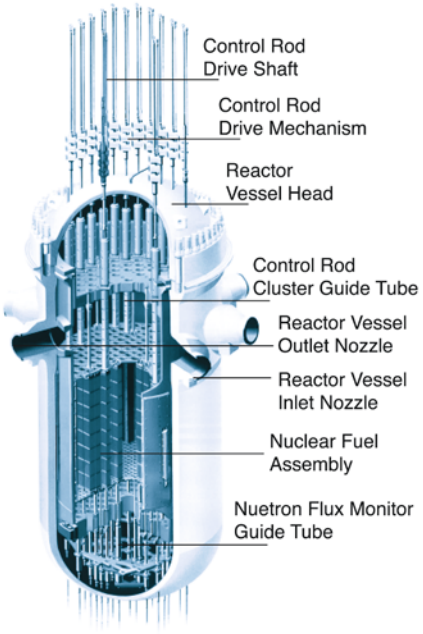
The first leak was detected at control rod drive mechanism tube No. 47, which attaches near the outer part of the vessel head. Then on May 5th, streaks of white powder were detected on the nearby thermocouple nozzle No. 67.

Since the first such incident in 1991 in the Bugey Nuclear Power Plant in France, cracks have been reported in control rod mechanism tubes in more than 30 other PWRs in the US, Sweden, Spain and Taiwan. As a precaution, in the period from August 1996 to August 2001, KEPCO exchanged the reactor vessel heads and changed the material used in penetration tubes to Inconel 690 in seven reactors: Mihama-1,2&3, Takahama-1&2 and Ohi-1&2. (Other Japanese power companies to take the same precautions were Shikoku Electric at Ikata-1&2 and Kyushu Electric at Genkai 1&2.)

However, at Takahama-3&4 and at Ohi-3&4, the reactor vessel heads were not replaced. Instead, in order to reduce the vessel head temperature during operation, the flow of coolant was increased. It was believed that the higher the temperature and the longer



Typical Pressurized Water Reactor Structure



the operating time, the more likely it was that

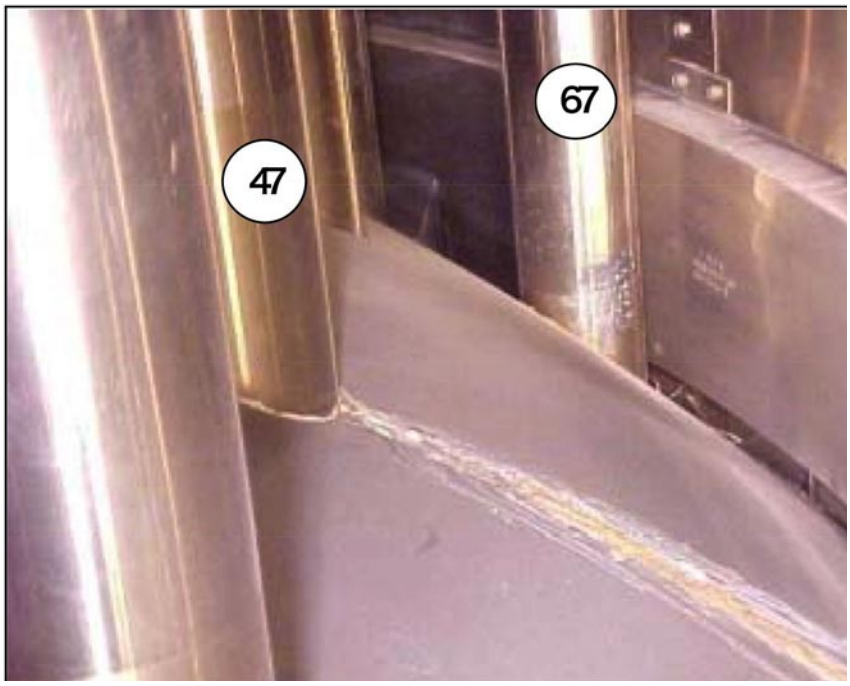
cracks would form. So in these four reactors, where the operating time was relatively short (as at October 2002, between approximately 80,000 to 140,000 hours), it was thought that cracks wouldn't appear during their operational life times (up to 200,000 hours). However, at Ohi-3, where it was believed that cracks were unlikely to form, cracks have in fact appeared, even though the actual operating time of about 100.000 hours falls well short of the expected operational life. There is therefore a high possibility that cracks will appear in other reactors.

If the cracks become large and go right through the metal, a large amount of coolant could leak out. The capacity to cool the reactor core would then no longer be sufficient. This situation could easily develop into an accident in which a large quantity of radiation is released into the environment.

The Ohi-3 accident shows that the counter measures taken to date have been inadequate.

Chihiro Kamisawa (CNIC)

Photo showing boric acid powder on the reactor head of Ohi-3 reactor



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Materials (STR-327 April 2001), which takes into account technological advances since then, the figure comes down to around 50kg, but this still means that a diversion of over 6 SQ worth of plutonium might escape detection.

To give a concrete example, take the Tokai Reprocessing Plant, which commenced operations in 1981. Since then, while 1000 tons of spent fuel have been reprocessed, the difference between the plutonium that went in as spent fuel and the plutonium that came out is over 200 kilograms. Of this around 60 kilograms is completely unaccounted for. The plan is to reprocess 800 tons of spent fuel per year at Rokkasho, so one would expect a much larger discrepancy to emerge there than at Tokai.

So what are they thinking about when they say that safeguards are in place for Rokkasho?

*Active tests use spent fuel, whereas uranium tests use depleted uranium.

Continued from page 10

been the secret behind Mamoru Fukae's 25 years of civil activism. Gentle, diligent, vague about details, never throws in the towel mid course, and never blames people; the hard worker who unifies the Kyushu movement against nuclear energy: that's Mamoru Fukae.

(1) See map on page 4.
(2) The term 'pluthermal' refers to the use of plutonium in the form of 'mixed oxide fuel' (MOX) in 'thermal' - as opposed to 'fast' - reactors.
(3) Yuko Fujita is a professor at Keio University doing research from an anti-nuclear perspective.

Anti-Nuke Who's Who

Mamoru Fukae: gentle, genial and diligent

by Yoko Yamanaka

With his base in the Kita Kyushu(1) citizens' movement and in his role as the secretary of the *We Want to Live in a Nuclear-Free Kyushu Collective* (now *Kyushu Network Against Nuclear Energy*), Mamoru Fukae has his finger on the pulse of the whole Kyushu anti-nuclear movement. His work with the *Assistance Movement to Chernobyl, Kyushu* was tremendous. He was busily engaged there for the ten years from its inception until it became properly established and he was able to hand over the reins to younger people. Then in 2000, when Kyushu Electric announced for the second time its pluthermal(2) plan, he became a joint director of the *Committee to Implement a Public Meeting with Kyushu Electric Power Company about Pluthermal*.

His activities have been many and various and if you were to make a list of his achievements you might imagine some furiously energetic activist, but you would be way wide of the mark. He smiles genially as he listens patiently to the chatter around him. It doesn't matter whether he is talking to Kyushu Electric or to officials from Saga Prefecture. His demeanor is always the same. Calm and polite, he never interrupts when other people are speaking. He gives the other person plenty of time to speak, before gradually exposing the contradictions and presenting new information from a different angle. It's about as far as you can imagine from a battle scene.

His words are gentle, but he's a mine of information about nuclear matters and the points he makes hit the mark. It appears that the source of his expertise is the *Denuclearization Newsletter*, which he produces every two to three months. This newsletter, which amounts to a little over twenty pages, is a pillar of strength for the Kyushu movement against nuclear energy. And Mamoru has a great memory for all o f it.

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He works for the Post Office and places a high priority on family life. He writes his newsletter and doesn't neglect to do his study. But you never get the feeling that he's busy. He's a bit of a mystery, really.

When Kyushu Electric announced its pluthermal plan for Genkai Nuclear Power Plant on March 1st, Mamoru resurrected the *Committee to Implement a Public Meeting about Pluthermal* for the first time in four years. He managed to get a favorable response from the Governor and Kyushu Electric. However, even within Saga Prefecture, the level of awareness of pluthermal is low. As for the fact that pluthermal is *dangerous*, about one percent have that awareness.

So Mamoru decided to invite Yuko Fujita(3) to Kyushu. First we get a message that just says, "Fujita will come." A little bit later he asks us, "Can you arrange a public meeting?" When asked like that we can hardly say no. But at this time we are very grateful to have someone come who can really speak about pluthermal. But the leaflet that Mamoru produced said, "Iraq: the damage and pollution caused by depleted uranium weapons." What's this? Isn't he coming to talk about pluthermal?

Maybe it's this vagueness about details that has

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NEWS WATCH

Further Developments re Spent-Fuel Storage Facility

Battles over the pros and cons of spent-fuel storage facilities (SFSF) continue. Here is an account of some of the developments since the previous issue of NIT.

On June 23rd in Nango Town, Miyazaki Prefecture, the Town Council adopted a petition from local residents calling for the withdrawal of the invitation to site a SFSF in their town. Another petition demanding the enactment of an ordinance to ban the establishment of a SFSF was also adopted. Furthermore, some council members submitted a draft resolution demanding that the Mayor retract his proposal. This also was approved.

In early June it was discovered that the Mayor of Nishinoshima Town, Shimane Prefecture was trying to lure a SFSF to the town. A campaign against this move was immediately launched by local residents. On June 11th the Mayor announced that he had abandoned this plan and presented a draft ordinance to ban the establishment of the facility. This was passed by the Town Council on July 1st and an ordinance banning the establishment of all nuclear facilities was approved.

In Gobo City, Wakayama Prefecture, a special investigative committee on administrative and financial problems had been established in March, but the committee was abolished on June 9th without having had any debate on whether or not to establish a SFSF. However, on June 22nd some members of the Federation of Neighborhood Associations presented a petition asking for a research study on the facility. Their petition was approved by the City Council on June 30th. In response to this move, a draft proposal to establish a special committee to carry out the study was submitted by some councillors and this proposal was approved.

In a new move, on July 14th Mihama Town Council, Fukui Prefecture, passed a resolution to invite the establishment of a SFSF. Then on the 15th the Mayor approached Kansai Electric Power Company (KEPCO) to begin studies for this purpose. Mihama Town is the home of Kansai Electric Power Company's (KEPCO) Mihama nuclear plant and this is the first move nationwide by a municipality where a nuclear power plant is located to invite a SFSF. The mayors of Takahama Town and Ohi Town, both also in Fukui Prefecture, have said that they are considering establishing an SFSF, but these were not official statements. These towns are home to KEPCO's Takahama and Ohi Plants respectively.

Meanwhile, Fukui Prefecture firmly maintains its stance of not approving a SFSF within the prefecture.

Municipalities Surrounding Saga Town Oppose High-Level Waste Dump

A petition submitted by a group of local residents to Saga Town Council in Kochi Prefecture requesting that an invitation be issued to site a High-Level Waste dump in their municipality, is still being deliberated (see News Watch 100).

One after another of the municipalities around Saga Town have passed resolutions against the petition: Ogata Town Council on June 17th, Nakamura City Council on the 23rd, Tosa-Shimizu City Council on the 26th and Kubokawa Town Council on the 30th. All of these resolutions were passed unanimously.

Ogata Town and Kubokawa Town are located immediately to the south and north of Saga Town respectively. Nakamura City is south of Ogata Town and Tosa-Shimizu City is a famous tourist center further south again.

Municipalities around Genkai Town Oppose Pluthermal Plan

Neighboring municipalities have begun to voice their opposition to Kyushu Electric Power Company's plan to use MOX fuel in its Genkai-3 (PWR 1,180 MW).

Statements of opposition were unanimously passed by the Nanayama Village Council on June 11th, then by the Chinzei Town Council on the 23rd. Both of these municipalities are located in Higashi-Matsuura County, Saga Prefecture, as is Genkai Town, home of the Genkai Nuclear Power Plant. Chinzei Town is adjacent to Genkai, but Nanayama Village is about 25 kilometers away. If the pluthermal plan were to be implemented at the Genkai Plant, Chinzei Town would receive more subsidies from the government, but in spite of this, the town still made clear its opposition to the plan.

Rokkasho Safeguards: What are they thinking about?

On 19th January this year Japan and IAEA signed an agreement regarding the Rokkasho Reprocessing Plant to be appended to their Safeguards Agreement. The document is not publicly available, but it covers details relating to inspections of the facility, etc. Following on from this, on 17th March Japan notified the US Government of its wish to add Rokkasho to the list of reprocessing facilities accepted under the reprocessing agreement between the two countries. This agreement and the list of acceptable reprocessing facilities are in the Implementing Agreement made pursuant to the Agreement for Cooperation between the Government of Japan and the Government of the United States of America Concerning Peaceful Uses of Nuclear Energy. On the same day they obtained the approval of the US Government.

The Japanese Government takes the view that, as a result of this, "Active tests* are now possible under the Japan-America Agreement." (June 4 Cabinet Reply to a question by Tetsuo Inami, Member of the House of Representatives.) However, it believes that "the agreement of the parties to the Japan-America Agreement and other such Agreements is not necessary" for the uranium tests*. Other countries with which Japan has nuclear energy agreements that are mentioned in the Cabinet Reply are Australia and Canada. The necessary formalities haven't been completed with these countries, but the Japanese government doesn't expect that they will take long.

However, even if Rokkasho gets the go ahead in a formal sense, the spirit of the IAEA safeguards system is being treated with contempt. In a paper given at the 2001 Meeting of the Japan Chapter of the Institute of Nuclear Materials Management, Toru Oginoya made the following comment. "The most important technical objective of the [IAEA] safeguards system is 'the timely detection of the diversion of a Significant Quantity'. Unfortunately, I have never seen any paper that claims that 'the timely detection of a Significant Quantity' is possible in the case of the Rokkasho Reprocessing Plant. Furthermore, when this question is put to the IAEA and to people involved in the safeguard process in Japan, no clear response is provided."

A Signficant Quantity (1 SQ) of plutonium is 8kg. Oginoya calculates that, based on 1987 IAEA standards, a diversion of as much as 263.2kg could go undetected at Rokkasho. Based on H. Aigner et al International Target Values 2000 for Measurement Uncertainties in Safeguarding Nuclear *Continued on page 9*

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