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Citizens' Nuclear Information Center

Akebonobashi Co-op 2F-B, 8-5 Sumiyoshi-cho, Shinjuku-ku,
Tokyo 162-0065, JAPAN Phone: +81 3 3357 3800 Fax: +81 3 3357 3801
URL: http://cnic.jp/english/ e-mail : cnic@nifty.com

Report on the 16th No Nukes Asia Forum

The No Nukes Asia Forum (NNAF) was held on Taiwan from September 26 to 29. NNAF is an annual conference held by a network of Asian NGOs who are fighting for a nuclear phaseout. Two hundred participants from eight countries, Mongolia, South Korea, Japan, Hong Kong, the Philippines, India, Turkey and Taiwan, took part in this 16th NNAF meeting. Mr. Ban and this writer took part from CNIC and reported to the meeting on the current state of Japan's nuclear power policy.

In front of No.2 Nuclear Power Plant in Taiwan

In the meeting, reports on accelerating nuclear power plant construction in Asia were heard and the many kinds of citizen efforts to oppose these were introduced, reconfirming the importance of international exchanges at the grassroots level. In particular, there were extremely disturbing reports on the current situation in India and Turkey, to which Japan is attempting to export nuclear power stations, and from Mongolia (see p.2), which is being targeted as a supplier of mineral resources.

The host country, Taiwan, gave numerous reports based on the experiences of the intense citizens' movements that took place in close succession in March this year with regard to opposition to nuclear power and resistance against the Taiwan-China Cross-Strait Service Trade Agreement. I think we have a lot to learn from these, especially from the new-style activities of the youth, represented by the Sunflower Movement, and the mutual relationship between these youth activities and the hardworking efforts of the citizens' movement in the background.

The conference participants visited the mass movement resource center, sponsored by the well-known Taiwanese democracy activist Lim Gi-hiong (formerly President of the Democratic Progressive Party). Visits were also made to the No.2 and No.4 Nuclear Power Plants and to Lanyu Island (Orchid Island).

(Hajime Matsukubo, CNIC)

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The Uranium Extraction Policy of Mongolia: The Current Situation

SELENGE Lkhagvajav
Head of the national movement "For a Nuclear Safe Mongolia"

1. Overall background

Mongolia is located between Russia and China, two large powers. The territory of Mongolia is 1.5 million km^2 and is populated by 2.9 million inhabitants. Mongolia possesses tremendous mineral resources.

There are approximately 1170 deposits of a total of 80 types of minerals registered in Mongolia. The mineral resources of the country are estimated by international economists to be worth USD1.3 trillion. Coal deposits alone are estimated to be 175 billion tons, which ranks Mongolia 15th in the world for coal resources. In addition, there are rich deposits of gold and silver, ores of the elements copper, iron, phosphorus, zinc, and uranium, as well as schist. Minerals make up 94 percent of the total exports of Mongolia.

2. Uranium resources of Mongolia

The uranium deposits are generally concentrated in the east of the country (see map below). Currently, 70 percent of the entire territory of Mongolia has been explored for uranium. Preliminary estimates suggest that Mongolia holds 1.5 million tons of uranium resources, which would rank as the 10th largest uranium resources in the world.

3. Policy of the government of Mongolia on uranium extraction

The Mongolian parliament approved the Law on Nuclear Energy, which governs uranium extraction and utilization of nuclear energy, on 16th July 2009. The adoption of this law legally guaranteed the extraction of uranium and the nuclear energy policy.

The government, named the "Democratic Renovation Government" was established in 2012, and included the extraction of uranium together with the production and export of uranium trioxide in its action plan for 2012-2016.

4. Licensing

According to recent information, 13 foreign-based companies, such as those in France, the Netherlands, UK, the Virgin Islands, the People's Republic of China, US, Canada, the Russia Federation and Japan hold 58 special licenses for the mining of radioactive minerals in Mongolia. The largest number, 25 special licenses, is held by the Areva Company of France.

5. Foreign companies implementing projects with a view to uranium extraction

Uranium extraction is not new to Mongolia. In 1988-1995, during the socialist period, the Soviets extracted uranium from an underground mine at the Mardai deposit in eastern Mongolia. Although the Soviets have left the area, high levels of radiation are still being emitted from the abandoned mine tailings (see figure).

NGOs have established that the radiation level in the area is 50 times the normal level. The local inhabitants pick up construction materials from the ruins of the apartment blocks in the high radiation area, where Soviet personnel used to live, to use in the construction of houses and even a kindergarten. However, there are still no experts or laboratories in the area to take regular measurements of the radiation level around the abandoned mine or investigate the health impacts on the local community.

Currently, Russian, Chinese, US and French government-owned companies have been working to implement projects in Mongolia. Of these, the French Areva Group is now ready to commence extraction.

The Areva Group first arrived in Mongolia in 1996. As mentioned above, it holds the largest number of licenses. The total area under their licenses is 9,124 km^2. Areva extracted uranium in Nigeria for 50 years, ceasing in October 2013. In exactly that same month, In October 2013, the French Foreign Affairs minister paid an official visit to Mongolia. France, Mongolia and Japan concluded a share-holding agreement and the preparations for uranium extraction got underway.

6. Public awareness on uranium.

For the extraction of uranium in Mongolia, Areva is using deep ground soaking technology. While described as the most reliable, this technology has shown itself to be unsuitable to the conditions of Mongolia. The Mongolians are nomadic pastoralists. In the areas where

Uranium map of Mongolia

uranium is extracted under the Areva technology, a massive drop in the numbers of livestock, with changes in livestock liver, lungs and other internal organs, is experienced together with generally defective young animals born and the local population suffering health impacts. These phenomena were never experienced before.

The government of Mongolia had so-called professional organizations conduct tests in those areas, but these have failed to establish the exact cause of the incidents. The specimens were then sent abroad for laboratory testing, but the results are still being awaited two years later. The Prime Minister reported to the public that a substance called selenium[1)] caused the incidents. However, he has no information about where the selenium emerged from to damage the health of animals and humans, and is seemingly unwilling to report on this even if the information is available. The Department for Nuclear Energy also fails to give correct explanations. According to his university major, the Prime Minister is a schoolteacher of physics, as is the Director of the Department for Nuclear Energy.

7. Civil society organizations

There is another issue, which may now seem to be obsolete, but which has metamorphosed and is hiding in a dormant phase. The foreign press and media published information in 2011 that the government of Mongolia had agreed to receive nuclear waste from foreign powers for burial in the Gobi zone, in the South of Mongolia, intriguing the passions of all powers that exploit nuclear energy.

In the first plan, the nuclear waste from nuclear power stations in Japan, Korea, and Taiwan was to be received, and then the issue of burying nuclear waste in the Mongolian Gobi was to be considered.

As soon as this information leaked, the Mongolian Green Party expressed strong opposition and the media publicized our protests daily. The result was that the Mongolian public became comparatively well aware of what nuclear waste is and of its harmful effects, leading to civil society organizations and individuals joining the protests. All these resulted in a Decree of the President of Mongolia, which was sufficient to calm the anger that had been inflamed by the issue.

Our politicians are sly, the President is one of them and might be the most devious of all. That is because he is in his second term of presidency. Within a week, the President reported to the UN General Assembly session that he had issued the decree. This raised the President's popularity both overseas and at home.

Nonetheless, intense activity has been taking place regarding the uranium extraction and nuclear power policies of the government. Another ironic point is that the President, Prime Minister and 90 percent of the MPs think that foreign nuclear waste is harmful, but that the nuclear waste that results when Mongolia begins to produce nuclear energy will be harmless, that there is no harm in uranium extraction, and even that it is permissible to contaminate some portion of the territory with radiation, because Mongolia has a vast territory anyway.

8. The attitude of the press and media on the uranium issue

According to the latest data, there are 166 TV stations, 84 radio stations, and 135 newspapers active in Mongolia. (This must wrong; there are only three million of us. If it is true, then Mongolia is undergoing a media boom along with the mining boom. Is this a good sign or an evil sign?)

At the beginning of the nuclear waste scandal mentioned above, the press and media reported our meetings and statements daily. However, the situation is quite the opposite now. All the numerous TV stations except one are private. The closet owners of these countless media outlets are the oligarchs. (Because of the small size of the population, we know very well which oligarch is the owner of which TV station.)

In the beginning, they would naively transmit what we said. However, because a lot of money is considered to be behind the uranium issue, their tactics have become more refined. The Department for Nuclear Energy spent a huge amount of the public budget on transporting journalists to resorts where they were brainwashed under the pretext of training, even to the extent of taking them to France and Kazakhstan. Those journalists would then praise uranium extraction and atomic energy until their throats became sore.

They also never forget to blame civil society organizations. They call us racketeers; accusing us of accepting bribes from foreign institutions. They also describe us as non-professionals without literacy on the uranium issue, not even knowing a single physics equation. (Maybe radiation will disappear if we learn equations by heart?)

There is another innovation in the Mongolian press and media. This is called the "agreement of closure." We have no idea whether such agreements are practiced in other countries. In Mongolia, large-scale companies pay huge amounts of money to TV stations, radio stations, and websites not to publish any negative information about them. If money was given directly it would be identified as corruption, so the contract is concluded for one year and named an "agreement of closure."

The Department of Nuclear Energy aims to get the public used to the terminology of "nuclear technology" by publishing daily news items in the press and media about "… the installation of radiation therapy equipment at the cancer hospital, application of nuclear technology for the improvement of livestock health" and, even further, "because nuclear reactions are constantly underway in the sun, we are always naturally exposed to radiation in the environment. Thus we shouldn't be wary of radiation; having a uranium mine is the dream of all nations. Therefore, we are lucky to have uranium so that we have the opportunity to have the mine make our dream come true," as the Director of the Department of Nuclear Energy says. Thus, the issue of uranium extraction in Mongolia is progressing under a strategy of brainwashing.

This is the actual situation in Mongolia as the country prepares for uranium extraction.

1) Selenium is a trace element required by living organisms, but compared with other elements it has the characteristic that the concentration at which it becomes toxic and the concentration at which it becomes deficient are extremely close. Excessive intake can lead to severe gastrointestinal distress, nervous disorders, respiratory insufficiency syndrome, cardiac infarction, and renal failure.

Report on the struggle of a Nuclear Power Subcommittee Member (2)

New support policies for nuclear power plants as Japan moves toward the deregulation of electrical power / Excuses for extending the life of Monju

Mr. Hideyuki Ban of CNIC has served as a member of the Nuclear Power Subcommittee of the Electricity and Gas Industry Committee under the Advisory Committee for Natural Resources and Energy since June 2014. He is participating in the discussions from the standpoint of a phaseout of nuclear power, supporters of which are a small minority in the subcommittee. This article is one in a series of reports on the work of the subcommittee as seen through his eyes.

The question of a video of the deliberations not being made public, as reported in Nuke Info Tokyo 162, has still not been resolved. The current situation is that poor quality audio recording of the proceedings will be made available on the Internet up to the time when the minutes of the meetings are published. An audio live Internet broadcast is also not provided.

In addition, discussions in the Radioactive Wastes Working Group, on which Mr. Ban also serves as a member, restarted on October 23 after deliberations ended following the publication of an interim report in May.[1)]

This report covers deliberations in the Nuclear Power Subcommittee up to the seventh meeting.

The third meeting (July 23) heard reports from the power companies and the host municipalities on the moves toward a reduction of dependence on nuclear power. The fourth meeting (August 7) concerned the maintenance of nuclear power engineers and other human resources (but this will not be dealt with in this report). The fifth meeting (August 21) discussed maintenance of the nuclear power business (nuclear power plants and the nuclear fuel cycle) under power industry deregulation, which was continued in the sixth meeting (September 16). The topic of the seventh meeting (October 2) was contributions toward the global peaceful use of nuclear power.

Policies to support nuclear power under power industry deregulation

Up to now, Japanese consumers have been unable to choose the power company from which they purchase their power. The system has been that, except for large-scale customers of 50 kW and over, if you live in Tokyo then you have no option but to contract with the Tokyo Electric Power Company (TEPCO) for power, and if you live in Osaka then you are forced to contract with Kansai Electric Power Company (KEPCO).

One of the election pledges of the Abe administration was the bold implementation of power system reform. A bill on the total deregulation of the power industry (making it possible for ordinary consumers to contract with any power company they like) was passed into law by the Diet, and deregulation will be implemented from 2016. A bill separating the power generation and power transmission sectors of each of the power companies is also scheduled to be submitted to the regular session of the Diet in 2015, with implementation planned for 2020. It is anticipated that these laws will help make cheap power available and give impetus to renewable energy, which has greater support among citizens.

The Ministry of Economy, Trade and Industry has always claimed that nuclear power is cheap, but the subcommittee, while tacitly recognizing that nuclear power will be weeded out under deregulation due to its higher costs, is considering what the government can do to ensure the continuing existence of nuclear power plants.

In order to continue to use nuclear power plants, it is necessary to rebuild (replace) power plants or construct new ones. However, the cost of building a nuclear reactor is enormous, at about 400 billion yen each, and it is said that a competitive environment would make investment in new reactor construction impossible. The power companies say that they are prepared to “promote the nuclear power generation business as private business and restructure the safe and stable supply of Japan’s energy and the security framework” (Hideki Toyomatsu, subcommittee's expert member, Kansai Electric Power Company), but are demanding that the government provide institutional support to back up this preparedness.

An example cited was the case of the Contract for Difference (CfD), now being considered in the UK as a means to ensure the establishment of an environment for the replacement or new construction of nuclear reactors.[2)]

The examples of loan guarantees for advanced nuclear power plants and guarantees against construction delays for new nuclear power plant construction that have been introduced by the US government were also discussed. While there was no clear indication of the introduction of such a system into Japan, it seemed that consideration was being given to some kind of similar support measures. Even if such support measures are introduced, citizens living close to NPSs or where they are planned are strengthening their opposition to NPSs more than ever before. For example, all the city assemblies around the Sendai NPS have decided against the proposed new Unit 3 there.

At the same time, the subcommittee envisaged that the huge investments made necessary by the strengthening of safety standards would lead to the decommissioning of some nuclear power plants. It is possible that some nuclear power plants that have not yet been operable for 40 years will remain shut down. If these are decommissioned, the remaining fixed assets would be instantly written off, resulting in large financial losses. Examples of special measures in other countries were given as means to avoid this. The background to these arguments is that the government wishes to encourage the decommissioning of obsolescent nuclear power plants in order to reduce dependence on nuclear power.

Rethinking the cost of nuclear power plants

One of the reasons why the introduction of a concrete system has not come into view is the issue of the cost of power generation. The media is reporting that the Ministry of Economy, Trade and Industry (METI) has begun estimations of power generation cost by different power sources. It seems that METI will review the calculations it made in 2011. According to the estimations at that time, the cost of generation by nuclear power was assessed at "from 8.9 yen/kWh". For this, damages due to the Fukushima Daiichi Nuclear Power Station accident were calculated to be 5.8 trillion yen. There is still no final settlement for the total damages from the Fukushima nuclear accident, but since the generation cost rises 0.1 yen for each trillion yen increase in damages, the generation cost is assessed with the prefix "from". [3)]

Assessing the cost of power generation by nuclear power over a range is based on the fact that the Atomic Energy Damage Compensation Act (AEDCA) imposes unlimited liability for the accident on the power company. Nevertheless, after the Fukushima accident had actually occurred, new mechanisms were brought into play to avoid the collapse of TEPCO. It appears that the government is now thinking along the lines of a negative reform in which unlimited liability becomes limited liability. In the case of limited liability, only a limited sum of money is included in the generation cost of nuclear power, resulting in a change in the direction of reducing the cost of nuclear power generation.

If the cost estimation includes the cheaper cost of new NPSs which meet the new regulation, it would not be necessary to introduce a new support system such as CfD.

Nationalization of reprocessing?

As it is government policy to maintain the nuclear fuel cycle, a proposal was submitted to the 5th and 6th meetings to strengthen government involvement in the trouble-ridden Rokkasho reprocessing plant, which is still unable to function fully as expected, and to support it by turning the facility into a government-approved corporation. Some committee members voiced the opinion that the reprocessing plant should be nationalized, but METI suggested the policy of not nationalizing the facility for the reason of "making use of private dynamism". It is also said that the Ministry of Finance is opposed to nationalization.

At present, the cost of reprocessing is included in electricity bills, and each power company entrusts the funds with the public utility foundation Radioactive Waste Management Funding and Reserve Center in accordance with their nuclear power generating capacity. However, it is said that even with this system to protect reprocessing, there is a possibility that power industry deregulation will force the reprocessing project into liquidation.

The author insists that maintaining the reprocessing project is unnecessary, but many of the subcommittee members claim that reprocessing is required for reasons of national policy. A proposal to commission the reprocessing project to the private sector has also been presented to the subcommittee. While a specific policy proposal is yet to be put

1) Please see the article in NIT 161 at http://www.cnic.jp/english/newsletter/nit161/nit161articles/02_HLW.html
2) http://www.meti.go.jp/committee/sougouenergy/denkijigyou/genshiryoku/pdf/005_03_00.pdf
3) *http://www.cas.go.jp/jp/seisaku/npu/policy09/pdf/20111221/hokoku_kosutohikaku.pdf (In Japanese)*

forward, in order to maintain reprocessing under the excuse that "it will lead to benefits for the whole country", a mechanism is being sought for levying the cost of reprocessing widely across consumers, including those who use renewable energy.

Company	Site Name	Unit	Stored fuel (ton)	Storage capacity (ton)
Hokkaido Electric Power Company	Tomari	1	163	212
		2	191	212
		3	41	583
Tohoku Electric Power Company	Onagawa	1	78	117
		2	217	289
		3	122	388
	Higashidori	1	104	568
Tokyo Electric Power Company (TEPCO)	Fukushima Daiichi	1	51	86
		2	101	119
		3	89	116
		5	229	179
		4	162	179
		6	151	173
		Temporary dry cask storage facility	74	74
		Common Pool	1101	1176
	Fukushima Daini	1	273	326
		2	285	345
		3	277	345
		4	290	345
	Kashiwazaki -Kariwa	1	318	348
		2	303	426
		3	291	421
		4	286	421
		5	303	415
		6	371	437
		7	437	442
Chubu Electric Power Company	Hamaoka	1 *	0	127
		2 *	200	313
		3	356	408
		4	341	405
		5	239	486
Hokuriku Electric Power Company	Shika	1	123	221
		2	35	467
The Kansai Electric Power Company	Mihama	1	34	60
		2	126	170
		3	228	440
	Takahama	1	82	120
		2	45	120
		3	468	740
		4	564	740
	Ohi	1	158	240
		2	Common with unit 1	
		3	650	890
		4	623	890
The Chugoku Electric Power Company	Shimane	1	55	114
		2	338	485
Shikoku Electric Power Company	Ikata	1	58	80
		2	84	120
		3	460	740
Kyushu Electric Power Company	Genkai	1	54	65
		2	64	96
		3	264	363
		4	489	538
	Sendai	1	514	761
		2	374	526
The Japan Atomic Power Company	Tsuruga	1	77	154
		2	502	709
	Tokai *		215	256
	Tokai No.2		159	179

* *Under decommissioning*

Table 1. *Stored spent fuel at Japan's Nuclear Power Plants (as of March 2012)*

The spent nuclear fuel problem

The problem of spent (waste) nuclear fuel came up for discussion at the sixth meeting, but there was no serious discussion on the handling of the roughly 17,000 tons of spent nuclear fuel that has continued to accumulate in the spent fuel pools at each of the nuclear power plant sites (**Table 1**).

Without the approval of the prefectures that host nuclear power plants to store spent fuel onsite, it is necessary to construct storage facilities outside the prefecture, but it seems that this approval will not be easily obtained. Since the power companies are the owners of the spent fuel, they are required to secure the storage capability. The power companies have avoided the storage problem saying that if reprocessing proceeds as expected, then securing new storage sites will become unnecessary. For this reason, as we have seen with the voicing of opinions in the subcommittee, there appears to exist the optimistic notion that if the government will support reprocessing then this will resolve the spent fuel storage problem.

Fast reactor or fast breeder reactor?

At the sixth meeting, mysterious documentation on Monju was handed out by the secretariat. Handouts in the subcommittee consist of "documentation" and "reference materials". Both included precisely identical nuclear fuel cycle diagrams, but in the "documentation" this was labelled "***Fast Reactor Cycle***", whereas the "reference materials" carried the label "***Fast Breeder Reactor Cycle***". Further, with reference to the Rokkasho reprocessing plant, included in the same nuclear fuel cycle diagram, the "documentation" labelled the plant as "***In the final testing stage***". While the "reference materials" labelled it as "***In the final testing stage: Improvement of the facility for high-level liquid waste vitrification (scheduled for completion in October 2014)***".

The author believes that this can be taken as a formal change of policy from the former fast breeder reactor development to fast reactor development. Moreover, the "Monju Research Plan" announced in 2013 gave the term "fast breeder reactor/fast reactor" showing equivalence for both types of reactor.

The Basic Energy Plan (April 2014) positioned Monju as "an international research base for volume reduction and reduction of the degree of toxicity of waste materials and improvements in technology related to nuclear non-proliferation." Monju was constructed as a fast breeder prototype reactor, but if it has lost its position as a breeder reactor, it will be necessary to devise a new *raison d'être* for it. That is, volume and degree of toxicity reduction. As Japan is totally at a loss about how to resolve the high-level waste disposal problem, if it can be said to be "useful for volume reduction", it might then be easier to gain acceptance for a restart of operations at Monju.

Doubts about the potential for reduction in the degree of toxicity

Reduction of volume and the degree of toxicity is nothing new. In the latter half of the 1980s, active research efforts were made into what was known as partitioning and transmutation research and the Phoenix Project. Research involving international cooperation was also carried out under the Omega Plan (A Proposal to Exchange Scientific and Technological Information Concerning Options Making Extra Gains of Actinides and Fission Products Generated in the Nuclear Fuel Cycle under OECD/+NEA International Cooperation), but had to be abandoned due to the inability to derive practical applications.

The subcommittee documentation claims that if spent nuclear fuel from Light Water Reactors is reprocessed and vitrified, the volume will be reduced to one quarter of the original, and further, will be reduced to one-seventh of the volume by the use of a fast reactor. However, it is meaningless to compare just the volumes of the spent fuel and the vitrified product. Uranium separated out by reprocessing is itself a waste product, and large amounts of radioactive waste materials are also produced in the process of reprocessing. It is the total volume of all this waste that should be compared. It is also calculated that the degree of toxicity after 1000 years will be twelve thousandths (12/1000) for LWR spent fuel directly disposed of after reprocessing, but four thousandths (4/1000) if reprocessed by fast reactor.

Using a fast reactor to bombard the spent fuel with high-energy neutrons will theoretically cause the minor actinides (Americium and Neptunium etc.) to fission, but this author believes that it is actually impossible, or extremely difficult, to realize this assumption. Whether or not the minor actinides can be fully separated from the high-level radioactive waste liquid separated out by reprocessing, and whether the minor actinides can be made to fission smoothly in the fast reactor are in doubt. In some cases, there is a fear that radionuclides with an even longer half life will be produced. Even if the technological outlook for this is favourable, the process of removing the minor actinides from the high-level radioactive waste liquid and then a process for fabricating the fuel using remote equipment would be required, necessitating a large-scale and complex facility for realization.

The significance of using Monju for volume reduction research, from which successful outcomes cannot be anticipated, is something that requires a serious rethink.

Contributions to global non-proliferation?

Contributions toward global peaceful use of nuclear power was the theme of the seventh meeting. A presentation was given by Dr. Charles D. Ferguson, President of the Federation of American Scientists. What remained in my impression of his presentation was the sentence, "We now stand at the juncture of whether the world will be contaminated by the nuclear inferno or destroyed by climate change." That the solution for this is nuclear power is something that I cannot accept. This author's position is that whatever mechanisms are introduced into nuclear power plants, they will never be able to reduce the risk of proliferation to zero, and climate change can be mitigated by means other than nuclear power plants.

There was no new content concerning proliferation in the subcommittee's documentation. The government wishes to claim that it can contribute to the global peaceful use of nuclear power through the export of nuclear power plants, and the grounds for this, it was explained, was that thoroughly ensuring peaceful use through bilateral agreements can prevent proliferation.

This author, however, is concerned that the export of nuclear power plants will, conversely, lead to nuclear proliferation, and not contribute to non-proliferation. I emphasized that preparing a position document on actual cases of bilateral agreements that allow reprocessing will probably not contribute to non-proliferation.

(Hideyuki Ban, Co-Director of CNIC)

Nuclear Power Station decommissioning
Schedule-first policy placing excessive burdens on workers
TEPCO has responsibility to protect workers' health and jobs.

Three years and eight months have passed since the outbreak of the nuclear crisis in Fukushima, yet the situation at the crippled Fukushima Daiichi nuclear power station (NPS) is nowhere near completion of the clean-up operations after the 2011 nuclear accident. The number of operations dealing with leaking radioactive water is increasing sharply at the plant. Such operations include the construction of additional tanks for storing contaminated water, reinforcement of the advanced (multi-nuclide) liquid processing system (ALPS), and the work to freeze the junction between the underground trench on the seaside and the nuclear reactor building. In addition, some large-scale projects are underway, for example, the construction of a new office building, a facility for managing workers' entry and departure, and a facility for incinerating protective suits and other contaminated articles.

Until 2013, the number of workers engaged in the plant's accident clean-up operations allegedly averaged 3,000 per day, but the number began rising steeply this year. The Tokyo Electric Power Company (TEPCO) announced at its regular press conference on October 30 that a total of 6,000 – 6,400 workers have been working at the site daily since mid-October (Figure 1).

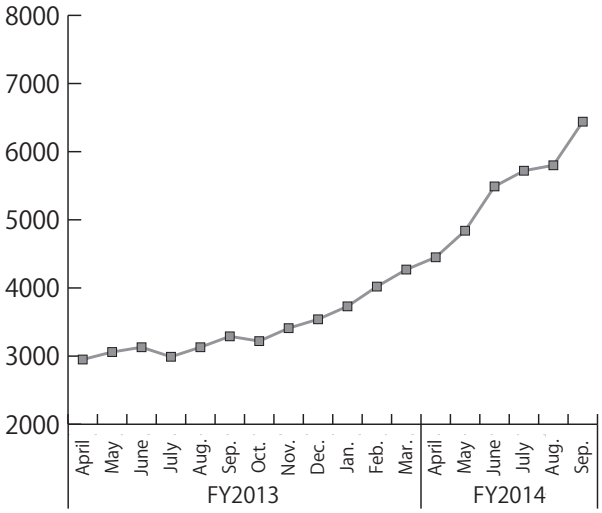


Figure 1. *Changes in the daily mean number of workers after FY2013 (results)*

Accidents and worker injuries increasing sharply at work sites

Amid this situation, the number of accidents and worker injuries are surging rapidly. On November 7, a heavy piece of construction material weighing 390 kg fell on top of three workers engaged in work to build tanks for storing processed radioactive cooling water. They sustained serious and light injuries. One worker suffered damage to his spinal cord and fell into a coma. He was taken to Fukushima Medical University by helicopter, accompanied by a medical doctor, and recovered consciousness there, but he still remains in a critical condition. One of the other two workers sustained a bone fracture on his ankle, and the third worker, bruises on both legs. These two workers were taken to Iwaki Kyouritsu Hospital by the prefecture's emergency helicopter. The three workers are employees of a subcontractor of Tokyo Power Technology Ltd. which is a TEPCO subsidiary.

The accident occurred in an area known as "J2." When workers from IHI Plant Construction Co. and others were trying to adjust the position of a steel section on top of the 2,400-ton welded-type tank to which a ladder was to be attached, the 25m-long semicircular steel section dropped from a height of 13 meters above the ground. The steel section fell onto the ground, rebounded upwards and hit the three workers, who were engaged in the work of building a barrier against possible water leaks around an adjacent tank.

Earlier, a similar accident occurred in the same area where work to construct additional tanks was underway. On September 20, an iron pipe was dropped, injuring a worker.

TEPCO to review roadmap for the decommissioning of Fukushima NPS Unit 1

The work to remove the spent nuclear fuel from the Unit 4 pool was completed on November 5. At the time when the 2011 nuclear accident occurred, the total of 1,535 nuclear fuel assemblies in the Unit 4 pool included 1,331 spent fuel assemblies and 204 fresh fuel assemblies. When the cooling-water circulation stopped, the nuclear fuel posed a grave threat. The remaining 180 fuel assemblies in the pool were unused ones that have a relatively low level of radioactivity. The utility plans to remove these assemblies as well, before the end of this fiscal year. If this work is completed, the risk from Unit 4 will be reduced to almost zero. However the nuclear fuel assemblies in Units 1, 2, and 3 remain in their spent fuel pools.

On October 30, TEPCO announced that it would review its plan to begin removing spent nuclear fuel from the Unit 1 pool in the first half of fiscal 2017 at the earliest. The utility said it will postpone this work for two years, to sometime in FY2019. The utility also announced that it would reschedule its plan to begin removing the molten nuclear fuel in the reactor from the first half of FY2020 to FY2025.

Previously, TEPCO has moved schedules forward, but this is the first time that the utility has delayed plans. By admitting that there will be delays in its work to remove the nuclear fuel, TEPCO is revising its plans for decommissioning of Fukushima Daiichi NPS.

One of the reasons for the rescheduling is that the work to remove part of the canopy above the Unit 1 building has been delayed for more than six months. Another reason is that TEPCO has changed its original plan to make alterations to the canopy and use it for the work to remove the spent nuclear fuel. Instead, it plans to remove the canopy and construct a new framework specially designed for the fuel removal operation on top of the reactor building. As for the work to remove the molten nuclear fuel, the utility is set to dismantle the existing framework, and install a different one designed exclusively for the removal operation.

To date, the workers engaged in the cleanup operations have been forced to work illegally long hours as they are ordered to hurry to get the work completed according to the schedule. It is reasonable for TEPCO to review the work schedule by attaching greater importance to reality, and pay less heed to its groundless slogan of "achieving decommissioning in 30-40 years."

In fact, a concrete path to decommissioning of the nuclear reactors has yet to come in sight. It still remains unknown exactly how the reactors are damaged or what the condition of the molten nuclear fuel is.

When removing the molten nuclear fuel, the containment vessel is to be flooded with water to provide shielding from strong radiation during the removal procedures. However, cooling water that is being poured into the vessels continues to leak. In preparation for the repair of the containment vessel, an investigation is being conducted by using a robot. Nevertheless, the points from which the cooling water is seeping have not been determined, and the technical method for taking out the molten nuclear fuel has not yet been decided.

The work schedule published by the government and TEPCO gives the impression that the work would progress in due course of time, but most of the proposed schedules are not based on reliable grounds and most are still under consideration.

Despite this situation, workers are ordered to give top priority to doing their jobs on schedule. "We are strongly pressured to do our jobs on schedule and even a one-day delay is not tolerated," said a worker. He went on to say, "In the Fukushima Daiichi NPS, many workers are assigned to new tasks for which they have no previous experience. Sometimes the work is delayed by bad weather. The more strongly they order us to stick to schedule, the more difficulties we will face."

While the workers are struggling with this situation, the review of the work schedule was carried out to reflect such realities in the schedule. Yet, at a joint meeting to discuss the work schedule, the government urged the utility to accelerate the timetable.

Growing numbers of workers engaged in water-shutoff operations above contaminated water are registering limit-over cumulative radiation exposure

In the work to freeze the junction between the seaside underground trench and the reactor building, workers are being forced to expose themselves to high-level radiation at 0.4 mSv for six hours per day. As it is not possible to freeze the water by inserting the cooling pipes alone, workers have been working round the clock inserting massive amounts of ice and dry ice into the water manually. These efforts, however, did not produce good results and the water did not freeze. Now they are pouring cement into the gaps between the cooling pipes and the reactor building to block the water flow. (See NIT162, Contaminated Water Woes at Fukushima Daiichi: Is Seepage Control Possible Using a "Frozen Earth Barrier"?)

At a meeting of the Nuclear Regulatory Commission (NRC), a TEPCO official in charge of the frozen earth barrier operation stressed that the utility is striving to reduce worker exposure by, for example, providing them with radiation-proof tungsten vests, and transferring heavily-exposed workers to work places in a low-radiation environment. Despite this comment, the cumulative radiation exposure levels of the 190 subcontractor workers participating in this operation remain high.

The subcontractors are setting the workers' annual radiation exposure limit at around 18 mSv. Of the 190 workers, five registered total radiation exposures of nearly 36 mSv (twice as high as the annual limit) in the 2014 February-September work operations alone, and these five workers will probably be unable to obtain any nuclear plant-related work next year.

Of the remaining workers, 22 have already exceeded their exposure quota for this year. Another 22 have only a small amount of quota left. This means that as many as 49 workers are currently facing the risk of losing their jobs due to excessive radiation exposure.

The question is how their jobs and income can be secured. Taking this and other problems into consideration, it is not hard to understand how difficult it will be to achieve decommissioning of the nuclear power plant.

It is TEPCO's responsibility to protect the health and income of the nuclear plant workers who are currently engaged in challenging operations under extremely severe working conditions.

(Mikiko Watanabe, CNIC)

Reference Material:

Radiation Exposure Data for Nuclear Power Plant Workers (Fiscal Year 2013)

Teble 1. FY2013 data on radiation exposure of workers at nuclear-reactor facilities for power generation (including Fugen and Monju)

Plant	Attribution	Effective dose level [mSv per person]											Collective effective dose	Average effective dose	Maximam effective dose
		～5	5～10	10～15	15～20	20～25	25～30	30～35	35～40	40～45	45～50	50～	(man・Sv)	(mSv)	(mSv)
Tokai	Power Company	309	0	0	0	0	0	0	0	0	0	0	0.00	0.0	1.4
	Subcontractor	920	0	0	0	0	0	0	0	0	0	0	0.00	0.0	0.3
	Total	1,229	0	0	0	0	0	0	0	0	0	0	0.01	0.0	1.4
Tokai-2	Power Company	342	0	0	0	0	0	0	0	0	0	0	0.03	0.1	1.1
	Subcontractor	1,569	0	0	0	0	0	0	0	0	0	0	0.30	0.2	4.6
	Total	1,911	0	0	0	0	0	0	0	0	0	0	0.33	0.2	4.6
Tsuruga	Power Company	407	0	0	0	0	0	0	0	0	0	0	0.02	0.1	1.8
	Subcontractor	1,790	6	3	0	0	0	0	0	0	0	0	0.36	0.2	14.7
	Total	2,197	6	3	0	0	0	0	0	0	0	0	0.39	0.2	14.7
Onagawa	Power Company	493	0	0	0	0	0	0	0	0	0	0	0.02	0.0	1.1
	Subcontractor	2,454	8	6	1	0	0	0	0	0	0	0	0.47	0.2	15.2
	Total	2,947	8	6	1	0	0	0	0	0	0	0	0.49	0.2	15.2
Higashidori	Power Company	289	0	0	0	0	0	0	0	0	0	0	0.01	0.0	0.6
	Subcontractor	902	1	0	0	0	0	0	0	0	0	0	0.09	0.1	6.6
	Total	1,191	1	0	0	0	0	0	0	0	0	0	0.10	0.1	6.6
Fukushima-1	Power Company	1,372	195	72	23	15	4	3	6	3	0	0	5.48	3.2	41.9
	Subcontractor	8,460	1,897	1,244	823	247	183	118	79	2	0	0	71.95	5.5	41.4
	Total	9,832	2,092	1,316	846	262	187	121	85	5	0	0	77.44	5.3	41.9
Fukushima-2	Power Company	548	0	0	0	0	0	0	0	0	0	0	0.05	0.1	2.1
	Subcontractor	1,428	11	1	0	0	0	0	0	0	0	0	0.34	0.2	10.7
	Total	1,976	11	1	0	0	0	0	0	0	0	0	0.39	0.2	10.7
Kashiwazaki-kariwa	Power Company	1,102	0	0	0	0	0	0	0	0	0	0	0.07	0.1	1.8
	Subcontractor	4,630	6	0	0	0	0	0	0	0	0	0	1.02	0.2	8.6
	Total	5,732	6	0	0	0	0	0	0	0	0	0	1.10	0.2	8.6
Hamaoka	Power Company	772	0	0	0	0	0	0	0	0	0	0	0.05	0.1	1.3
	Subcontractor	3,090	23	2	0	0	0	0	0	0	0	0	0.85	0.3	14.8
	Total	3,862	23	2	0	0	0	0	0	0	0	0	0.90	0.2	14.8
Shika	Power Company	399	0	0	0	0	0	0	0	0	0	0	0.02	0.1	2.2
	Subcontractor	1,459	85	0	0	0	0	0	0	0	0	0	0.98	0.6	9.5
	Total	1,858	85	0	0	0	0	0	0	0	0	0	1.00	0.5	9.5
Shimane	Power Company	510	0	0	0	0	0	0	0	0	0	0	0.02	0.0	0.9
	Subcontractor	1,914	2	0	0	0	0	0	0	0	0	0	0.52	0.3	5.2
	Total	2,424	2	0	0	0	0	0	0	0	0	0	0.53	0.2	5.2
Tomari	Power Company	453	0	0	0	0	0	0	0	0	0	0	0.00	0.0	1.1
	Subcontractor	2,192	0	0	0	0	0	0	0	0	0	0	0.14	0.1	4.6
	Total	2,645	0	0	0	0	0	0	0	0	0	0	0.14	0.1	4.6
Mihama	Power Company	451	0	0	0	0	0	0	0	0	0	0	0.01	0.0	0.8
	Subcontractor	1,887	0	0	0	0	0	0	0	0	0	0	0.20	0.1	3.4
	Total	2,338	0	0	0	0	0	0	0	0	0	0	0.22	0.1	3.4
Takahama	Power Company	554	0	0	0	0	0	0	0	0	0	0	0.03	0.0	0.9
	Subcontractor	3,525	1	0	0	0	0	0	0	0	0	0	0.69	0.2	5.3
	Total	4,079	1	0	0	0	0	0	0	0	0	0	0.72	0.2	5.3
Ohi	Power Company	520	0	0	0	0	0	0	0	0	0	0	0.09	0.2	2.5
	Subcontractor	4,286	35	4	0	0	0	0	0	0	0	0	1.99	0.5	12.5
	Total	4,806	35	4	0	0	0	0	0	0	0	0	2.08	0.4	12.5
Ikata	Power Company	407	0	0	0	0	0	0	0	0	0	0	0.03	0.1	2.0
	Subcontractor	2,154	17	0	0	0	0	0	0	0	0	0	0.71	0.3	8.3
	Total	2,561	17	0	0	0	0	0	0	0	0	0	0.74	0.3	8.3
Genkai	Power Company	534	0	0	0	0	0	0	0	0	0	0	0.01	0.0	0.7
	Subcontractor	2,770	0	0	0	0	0	0	0	0	0	0	0.36	0.1	2.7
	Total	3,304	0	0	0	0	0	0	0	0	0	0	0.37	0.1	2.7
Sendai	Power Company	315	0	0	0	0	0	0	0	0	0	0	0.01	0.0	1.3
	Subcontractor	2,577	22	0	0	0	0	0	0	0	0	0	0.99	0.4	10.0
	Total	2,892	22	0	0	0	0	0	0	0	0	0	1.00	0.3	10.0
Commercial plant total	Power Company	9,777	195	72	23	15	4	3	6	3	0	0	5.95	0.6	41.9
	Subcontractor	48,007	2,114	1,260	824	247	183	118	79	2	0	0	81.96	1.6	41.4
	Total	57,784	2,309	1,332	847	262	187	121	85	5	0	0	87.95	1.4	41.9
Fugen	Power Company	120	1	0	0	0	0	0	0	0	0	0	0.04	0.3	5.8
	Subcontractor	444	1	0	0	0	0	0	0	0	0	0	0.10	0.2	5.6
	Total	564	2	0	0	0	0	0	0	0	0	0	0.13	0.2	5.8
Monju	Power Company	411	0	0	0	0	0	0	0	0	0	0	0.00	0.0	0.0
	Subcontractor	915	0	0	0	0	0	0	0	0	0	0	0.00	0.0	0.0
	Total	1,326	0	0	0	0	0	0	0	0	0	0	0.00	0.0	0.0
Total	Power Company	10,308	196	72	23	15	4	3	6	3	0	0	5.99	0.6	41.9
	Subcontractor	49,366	2,115	1,260	824	247	183	118	79	2	0	0	82.06	1.6	41.4
	Total	59,674	2,311	1,332	847	262	187	121	85	5	0	0	88.08	1.4	41.9

Table 2. Number of persons engaged in work involving radioactivity and total exposure, FY2013

Name of Reactor etc.		Approximate total number of persons	Total exposure (man-Sv)	Average exposure (mSv)
Nuclear power reactors	Other than Fukushima Daiichi NPS	48,200 (48,600)	10.51 (11.35)	0.2 (0.2)
	Fukushima Daiichi NPS	14,700 (13,700)	77.44 (78.81)	5.3 (5.7)
	Total, Average	62,900 (62,400)	87.95 (90.16)	1.4 (1.4)
R&D, etc.	R&D reactor facilities	1,900 (1,800)	0.13 (0.15)	0.1 (0.1)
	Fabrication facilities	2,700 (2,900)	0.12 (0.24)	0.0 (0.1)
	Reprocessing facilities	6,400 (6,600)	0.27 (0.25)	0.0 (0.0)
	Waste and waste management facilities	1,500 (1,500)	0.00 (0.00)	0.0 (0.0)

(Numbers in brackets are for FY2012)

On September 24, the Nuclear Regulation Authority (NRA) released their "FY2013 Report on Radiation Management for Nuclear Facilities"[1)]

This report summarizes the exposure management data for persons engaged in work involving radioactivity from the FY2013 (April 2013 to March 2014) "Situation on Management of Radioactive Wastes in Commercial Nuclear Power Reactor Facilities, R&D Stage Nuclear Power Facilities, Fabrication Facilities, Reprocessing Facilities, Waste Disposal Facilities and Waste Management Facilities, and the Situation on Exposure Management of Persons Engaged in Work Involving Radioactivity." The exposure distribution of persons engaged in work involving radioactivity in commercial nuclear power reactor facilities is summarized in **Table 1**.

The FY2013 overview for all nuclear reactor facilities (total number of persons engaged in work involving radioactivity, total exposure and average exposure) is summarized in **Table 2** with FY2012 figures in brackets.

On November 4, the Radiation Effects Association's Central Recording Center for Persons Engaged in Work Involving Radioactivity released their "Statistical Materials for the Exposure Recording Management System of Persons Engaged in Nuclear Power Plant Work."[2)]

1) http://www.nsr.go.jp/committee/kisei/h26fy/data/0029_05.pdf -- In Japanese
2) http://www.rea.or.jp/chutou/koukai/H25nendo/honbun-h25.htm -- In Japanese

Reference Material:

Japan's Separated Plutonium Inventory (as of the end of 2013)

The inventory of Japan's separated plutonium as of the end of 2013 was released at the 31st Regular Meeting of the Japan Atomic Energy Commission on September 16, 2014.

Changes in the plutonium inventory stored in Japan

While nuclear reactors in Japan have been stopped after the Fukushima nuclear accident, there were changes in the plutonium inventory stored in Japan. Firstly, 20 assemblies of mixed oxide (MOX) fuel for the Kansai Electric Power Takahama Nuclear Power Plant Unit 3 arrived from France (June 27, 2013), which increased the plutonium inventory in Japan by 901 kg. At Kyushu Electric Power's Genkai Nuclear Power Plant, unspent MOX fuel assemblies were unloaded from Unit 3, which increased the plutonium inventory in Japan by 640 kg. These increases have been reflected in the plutonium inventory stored by the respective power companies, thus increasing the total plutonium inventory stored at nuclear reactors and other facilities in Japan. (The amount on the Total Plutonium line is different by approximately 3 kg. The difference is attributed to nuclear loss*[1].)

1. Japanese Inventory of Separated Plutonium		2009		2010		2011		2012		2013	
		JAEA	JNFL	JAEA	JNFL	JAEA	JNFL	JAEA	JNFL	JAEA	JNFL
Reprocessing Facilities	Plutonium nitrate etc.	673	279	672	281	669	283	668	283	664	283
	Plutonium oxide	103	3,329	80	3,329	83	3,329	83	3,329	84	3,329
	Total Plutonium	777	3,607	753	3,610	752	3,612	751	3,612	748	3,611
	Total Fissile Plutonium	517	2,346	500	2,347	499	2,348	498	2,348	496	2,347
	Balance	-3	3	-1	2	0	2	-1	1	-3	-1
Plutonium Fuel Fabrication Plant	Plutonium oxide	2,304		1,916		1,941		1,939		1,937	
	Plutonium in test or fabrication stage	1,008		1,026		976		978		981	
	New fuel etc.	171		424		446		446		446	
	Total Plutonium	3,483		3,365		3,363		3,364		3,364	
	Total Fissile Plutonium	2,420		2,334		2,333		2,333		2,333	
	Balance	-8		-8		-2		1		0	
Nuclear Reactors and Other Facilities	Joyo	134		134		134		134		134	
	Monju	161		31		31		31		31	
	Commercial Reactors	1,458		1,600		959		959		2,501	
R&D facilities	Critical experiment etc.	443		444		444		444		444	
	Total Plutonium	2,196		2,208		1,568		1,568		3,109	
	Total Fissile Plutonium	1,589		1,549		1,136		1,136		2,133	
Total Plutonium		10,063		9,936		9,295		9,295		10,833	
Total Fissile Plutonium		6,871		6,730		6,316		6,315		7,309	

2. Overseas Inventory of Separated Plutonium											
Held Overseas	Recovered in UK			17,055		17,028		17,052		20,002	
	Recovered in France			17,970		17,931		17,895		16,310	
	Total Plutonium			35,025		34,959		34,946		36,312	
	UK: Fissile Plutonium	11,531		11,643		11,616		11,622		13,526	
	France: Fissile Plutonium	12,599		11,730		11,692		11,655		10,604	
	Total Fissile Plutonium	24,130		23,373		23,308		23,277		24,130	

3. Separated Plutonium in Use											
Supply	Separated Plutonium	0	0	0	0	0	0	0	0	0	0
Used	for Monju	191		412		0		0		0	
Loaded	Reactors	1,345		1,462		640		0		0	

Name of Reactor etc.		Stored Plutonium		Loaded Plutonium	
		Separated Plutonium		Separated Plutonium	
		Total(kgPu)	Fissile (kgPuf)	Total(kgPu)	Fissile (kgPuf)
Japan Atomic Energy Agency	Joyo	134	98	261	184
	Monju	31	21	1,533	1,069
Tokyo Electric Power Co.	Fukushima Daiichi Unit3	-	-	210	143
	Kashiwazaki-kariwa Unit3	205	138	-	-
Chubu Electric Power Co.	Hamaoka Unit4	213	145	-	-
Kansai Electric Power Co.	Takahama Unit3	901	585	368	221
	Takahama Unit4	184	110	-	-
Shikoku Electric Power Co.	Ikata Unit3	198	136	633	436
Kyushu Electric Power Co.	Genkai Unit3	801	516	677	468
R&D facilities	Fast Critical Assembly	331	293		
	Deuterium Critical Assembly	87	72		
	Experiment Critical Facility and Transient Experiment Critical Facility	15	11		
	Other R&D facilities	11	9		

JAEA: Japan Atomic Energy Agency JNFL: Japan Nuclear Fuel Limited.

Changes in the plutonium inventory stored in the UK and France

Japan's plutonium inventory in the UK increased 2,950 kg over last year while that in France decreased 1,585 kg. Of the increase in the inventory in the UK and the decrease in the inventory in France, 650 kg is attributed to exchange between the two countries: 650 kg owned by Japan (TEPCO) and stored in France was exchanged with 650 kg owned by Germany and stored in the UK.

The approximately 2.3-ton increase after the 650 kg in the UK-stored inventory is attributed to "allocation*[2]," according to the JAEC meeting minutes, but the details are unknown.

*1 Nuclear loss: Loss (decrease) resulting from natural decay of fuel substances

*2 When a country undertakes reprocessing for multiple countries, the country may allocate the plutonium generated by the operation of the reprocessing plant to the customer countries, according to the respective contract amounts.

Current State of Post-Accident Operations at Fukushima Daiichi Nuclear Power Station

May to end October 2014

State of the Plant

Many of the measuring instruments installed in the Fukushima Daiichi Nuclear Power Station (FDNPS) measuring system continue to malfunction as a result of the accident. Although there is no guarantee of the accuracy of values being measured, if these values are taken as the premise, from the water temperature in the containment vessels and the spent fuel pools, and from the releases of Xenon-135, it can be estimated that the state of the reactors is stable. Up to now, Tokyo Electric Power Company (TEPCO) has assessed releases of radioactive substances into the atmosphere at 10 million Bq/h However, from the fact that the state of the reactors is stable and that releases continue to be at a low level, from May TEPCO has used the expression "less than" 10 million Bq/h. (**See Figure 1**)

It became clear from press reports in July that there was a strong possibility that work to remove debris from Unit 3 carried out in fall 2013 resulted in the dispersal of large amounts of radioactive substances beyond the boundaries of the power station site. In March, TEPCO received a notification from the Ministry of Agriculture, Forestry and Fisheries (MAFF) saying that there was a strong possibility that pollution of agricultural products had been caused by debris removal work. In addition, the dismantling of the cover on the Unit 1 building and the removal of debris was scheduled for July. This is just one more case of TEPCO's unchanging tendency to conceal data until it is disclosed by third parties despite the fact that TEPCO is aware of what is happening.

Current State of Post-Accident Operations

1. State of Operations concerning Molten Fuel

The current state is that for each of the reactors, surveys of the plant situation as preparation for decontamination of the buildings, surveys to reveal the locations of leaks in the containment vessels, as well as R&D work on various kinds of devices, are being implemented in parallel.

2. State of Operations concerning Spent Fuel Pools

The removal of fuel assemblies from Unit 4 began in November 2013, and of the 1,535 assemblies that were being stored in the Unit 4 spent fuel pool at the time of the accident, 1,331 spent fuel assemblies have been transferred to the common pool (announcement of November 5, 2014). The transfer of all spent fuel from Unit 4, including the three damaged assemblies that had been stored in the spent fuel pool since before the accident, is due to be completed by the end of November. Due to lack of capacity in the common pool, fresh fuel in the Unit 4 spent fuel pool will be transferred to the Unit 6 spent fuel pool (scheduled for completion in December).

Removal of large debris from the operating floor of Unit 3 is now complete. At present, measures are being taken to reduce the radiation dose level, but the level is still far above the target of 1 mSv/h and additional measures are now being considered. The construction work to put in place the cover for removal of the fuel is scheduled to

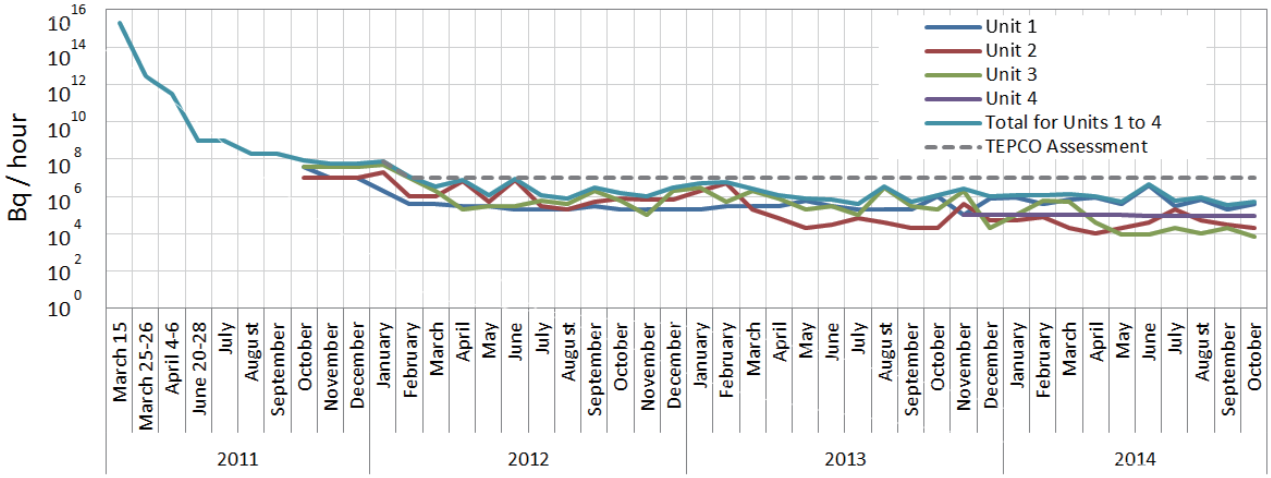


Figure 1. Releases of radioactivity from Units 1 to 4 of Fukushima Daiichi Nuclear Power Station (Bq/h)
From materials prepared and submitted by the secretariat to the Government and TEPCO's Mid-to-Long Term Countermeasure Meeting and Secretariat of the Council for the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station. (However, this was for assessing leakage from exhaust outlets and gaps in building covers and does not include leakage to groundwater, etc.) TEPCO's assessment was 10 million Bq/hr prior to May 2014, but since May 2014 has been stated to be less than 10 million Bq/hr.

begin in the near future. Moreover, on August 29, an accident occurred in which the operating console of the spent fuel pool fuel handling machine and other large debris fell into the pool.

The dismantling of the cover now in place around the reactor building of Unit 1 was due to begin in July 2014 in order to carry out the work of removal of debris from the operating floor, but this task has been delayed due to the inadequacy of measures to suppress the dispersal of radioactive substances. (Application of an anti-dispersal agent is now being implemented and it is planned to start debris removal in March 2015.) The schedule for removing spent fuel has been delayed from 2017 to 2019, and removal of molten fuel from 2020 to 2025.

While there is no great damage to the Unit 2 reactor building, high dose rates have made it impossible to confirm details of the state of the interior of the building. The construction method for the cover for removal of the nuclear fuel was to be determined during the first half of 2014, but this decision has now been delayed until mid-2016.

Additionally, the fuel assemblies removed from the spent fuel pools in each of the reactor buildings are to be stored in the common pool, but since there are concerns over storage of damaged fuel a special storage rack for damaged fuel has been installed.

3. The Problem of Contaminated Water

According to an estimate by TEPCO, roughly 800 m^3 of underground water are flowing into the reactors of Units 1 to 4 per day, 400 m^3 of which is flowing into the reactor buildings and the remaining 400 m^3 being released into the ocean.

The following measures are being planned to suppress the inflow of groundwater:

1) A groundwater bypass to reduce the inflow of groundwater by pumping the water up using pumping wells installed on the land side of the site and releasing the water into the ocean. The pumping of underground water began in April 2014, and the water pumped up is being released into the ocean after confirmation that the radioactivity in the water is below the standard. According to the plan, the amount of groundwater prevented from flowing into the buildings is 50 m^3/day. TEPCO says that in combination with the water prevention measures in the high-temperature incinerator building, a reduction of 90 m^3/day was seen as of October 14.

2) Pumping up groundwater from the subdrains in the vicinity of the buildings and releasing the water into the ocean. In addition to the existing 27 subdrains, 15 new subdrains have been constructed, and experimental operations with these began from September 2014. TEPCO says that it is releasing this pumped up groundwater into the ocean after purification, but as the pumped groundwater is clearly contaminated, opposition from nearby fishery cooperatives has been steadfast, and implementation has not yet begun as of end October.

3) Construction of an inland water barrier. A frozen earth barrier is to be created by burying 749 refrigeration pipes and 151 temperature measuring tubes at set intervals around Units 1 to 4. Installation work began in June and the barrier is scheduled to begin operation in the first half of FY2015.

4) Construction of an ocean side water barrier. This was scheduled to begin operation around September 2014, but has not yet been implemented since it is conditional upon the release of groundwater from the subdrains.

5) Prevention of water leakage from the Unit 1 to 4 reactor buildings through holes, etc. in the outer walls of the buildings. (Scheduled to be completed in FY2017.)

6) Operation of the Advanced Liquid Processing System (ALPS). The existing three ALPS plants were scheduled to be fully operational in mid-2013, but are experiencing frequent problems. Hot experiments with the added ALPS3 plant and the high-performance ALPS1 plant, built with a government subsidy, began in September and October.

7) An increase in the number of waste water tanks. Tanks to store contaminated water and purified water that still contains Tritium were to be increased to a total of around 800,000 m^3 by the end of FY2014, but a further 100,000 m^3 was added to this in July, when it was announced that storage for a total of 930,000 m^3 of water would be installed.

8) Removal of contaminated water from trenches. Removal of contaminated water from branch trenches was completed in September 2013. Preparatory work to remove contaminated water from the main trenches began with an attempt to prevent water leakage by freezing the water in the junctions between the buildings and the trenches, but as it proved impossible to freeze the water, the insertion of packing material began on October 16.

In addition, in order to prevent direct flow into the ocean when contaminated water leaks from the storage tanks, of the drainage canals onsite, the C drainage canal, which is directly connected to the ocean, was altered in July to flow into the harbor.

(Hajime Matsukubo, CNIC)

Group Introduction

From Fukui, the "Nuclear Ginza" Sayonara Genpatsu Fukui Network

Taeko Nakajima

The Sayonara Genpatsu Fukui Network was established in July 2011, four months after the occurrence of the Fukushima nuclear accident that followed the March 11 earthquake.

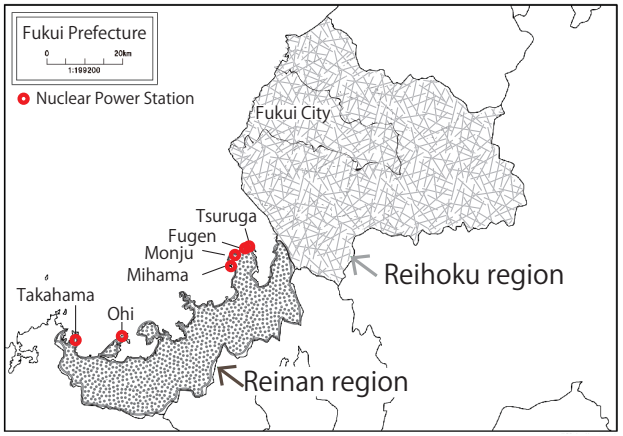
This network was formed rather spontaneously — it originated from informal gatherings of citizens who had witnessed the tremendous nuclear accident and resolved to stop using nuclear power. In Fukui Prefecture, where we live, there are 15 nuclear reactors (one of which is being decommissioned), and the accident in Fukushima was not someone else's problem, but ours.

Fukui Prefecture is located near the middle of the Japanese Sea coastline of Japan's main island. The prefecture has a chain of mountains which divides the prefecture into the northern Reihoku region and southern Reinan region. In the Reihoku region, rice paddies spread out across the plain and this is where Fukui City, the prefectural capital, is located. The Reinan region is a narrow extension of land, which has a long ria coastline (Wakasa Bay). The prefecture has a population of about 800,000, of which 650,000 lives in Reihoku and 150,000 in Reinan. The narrow strip of land on the Reinan coastline is home to the 15 nuclear reactors, and thus the area is called the "*Nuclear Ginza*" (named after Japan's busiest shopping district). The area is also home to the fast breeder reactor Monju, which uses liquid metal sodium as coolant and plutonium as fuel, and is more dangerous than commercial light water reactors.

The first reactor in Reinan started up in 1970, and people in the region have cohabitated with nuclear reactors for more than 40 years. An antinuclear movement appeared in the meantime, but many people today are dependent on reactor-related work to earn a living, and it is difficult to speak out against nuclear power. In Reihoku, in contrast, people are unfamiliar with nuclear reactors, reactor operators' leaflets promoting the safety of nuclear power are distributed to every household regularly, and money from reactor operators is lavishly used to organize various events, which suppresses opinions against nuclear power.

The Fukushima nuclear accident occurred under such circumstances, and we thought we should review the use of nuclear power. Our network was organized on the initiative of Reihoku citizens sharing the same thoughts. Most of our members have not been involved in the antinuclear movement in the past. In September 2011, shortly after the establishment of the network in the July following the Fukushima accident, we organized a lecture about low-dose exposure. Starting from this event, we have organized various events and actions, including lectures, reactor restart protest gatherings and rallies, the submission of statements and open questions to the prefectural government, film screenings, questionnaire surveys to prefectual and city assembly members to sample their ideas about stopping nuclear power, discussions with assembly members, an antinuclear-power panel exhibition, and the releasing of balloons from near nuclear power station sites.

Releasing balloons from near NPS



Location of Nuclear Power Stations in Fukui

In solidarity with the Tokyo Friday action in front of the Prime Minister office, we are organizing a gathering and rally to express our objection to the possible restart of reactors every Friday evening in front of the Fukui Prefectural Government Office. As of the end of October 2014, we had organized the Friday gatherings 118 times. In October, we organized a panel exhibition and lecture event, entitled "Nuclear Accident and Evacuation — Learning from Fukushima."

The Sayonara Genpatsu Fukui Network has organized actions beyond the boundaries of Fukui Prefecture. To change Japan's nuclear policy, we believe that actions coordinated across the nation are essential, in addition to local actions.

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In May 2014, the Fukui District Court pronounced the Judgment on Claim for Injunction on Operation of No. 3 and No. 4 Units at Ohi Nuclear Power Plant, which stated that the power company must not operate the reactors. The judgment not only cheered us up, but also gave hope and courage to people who believe that all nuclear reactors should no longer be used. The impressive outline of the judgment has been translated into other languages (English, Chinese, Korean, Turkish, and Vietnamese).
"Outline of Judgment on Claim for Injunction on Operation of No. 3 and No. 4 Units at Ohi Nuclear Power Plant" (translated by Greenpeace)
http://adieunpp.com/download&lnk/ooi-urteil-engl-may212014.pdf

Website of Sayonara Genpatsu Fukui Network: *http://www2.interbroad.or.jp/shimada/denuclear.html (In Japanese)*

NEWS WATCH

Kagoshima Prefecture and Satsumasendai City Agree to Sendai NPS Restart

Japan has 48 nuclear reactors with a combined capacity of 4,416 MW, none of which is currently operating. In the lead for restarts are the Sendai NPS Units 1 & 2 (both PWR, 890 MW) operated by Kyushu Electric Power Company. The Sendai NPS is located in the city of Satsumasendai, Kagoshima Prefecture.

On October 28, Mayor Hideo Iwakiri of Satsumasendai accepted the city council's adoption of an appeal from citizens seeking a restart and rejection of an appeal by opponents, declaring his agreement with the restart. On November 7, Governor Yuichiro Ito of Kagoshima Prefecture similarly accepted the prefectural assembly's adoption of a petition for restarting the reactors and declared his agreement.

The construction plans for upgrading safety at the power plant have been examined and approved by the Nuclear Regulation Authority (NRA), so if the facilities pass the official inspection before commercial operation upon completion of construction work, and if revisions in the safety regulations being similarly investigated by the NRA are approved, conditions for reactor restarts will be fulfilled. Neighboring municipalities, however, have expressed dissatisfaction with the "local consensus" involving only Kagoshima Prefecture and Satsumasendai City, and there is deep-rooted opposition to the restarts among peple in Kagoshima Prefecture and Japan. More twists and turns are expected in the road to restarting the reactors.

Two NRA Members Replaced

Two of the five NRA members were replaced on September 19. Akira Ishiwatari, a former Tohoku University professor, took over for Kunihiko Shimazaki, professor emeritus of the University of Tokyo, who was seen as opposing the electric power companies in the assessment of active fault lines; and Satoru Tanaka, former professor at the University of Tokyo Graduate School, replaced Kenzo Oshima, former ambassador to the United Nations. Tanaka is one of the key figures of the so-called "nuclear village," so his appointment was decided while ignoring voices that opposed or questioned the appointment.

Problems Soon Arise with Monju's New System

The Japan Atomic Energy Agency (JAEA) has launched the new system for the Monju reactor, holding an inaugural ceremony on October 1 in Tsuruga City, Fukui Prefecture, where the reactor is located, for the Monju Planning Research and Development Center. This will be a support organization for the Monju fast breeder reactor (280 MW) under the direct control of the director of the JAEA. The "Monju reformation," undertaken in response to omissions in equipment inspections, had not been completed at the time (September 2014) and was delayed for half a year.

Then, on October 11, a local newspaper in Fukui Prefecture reported that about one third of the 180 cameras installed around the secondary sodium coolant pipes were malfunctioning and that nothing had been done about the problem for over a year and a half. The Nuclear Regulation Authority determined this to be in violation of safety regulations at its meeting on October 29. A lack of progress in reforming awareness has again come to light.

Tokai Reprocessing Plant to be Permanently Shut Down

On September 29, the JAEA announced its intention to shut down the Tokai Reprocessing Plant permanently. To bring the plant into compliance with new regulatory standards, an additional outlay of more than 100 billion yen would have been needed, and getting the superannuated facilities to meet standards was deemed too difficult. The plant had already finished processing spent commercial nuclear reactor fuel entrusted to it by the electric power companies by March 2006, and there is no urgency to process the remaining spent fuel from the Fugen prototype advanced thermal reactor (currently undergoing decommissioning) that it is storing at its own facilities. It has the options of entrusting the work to reprocessing plants overseas or disposing of it directly.

Regarding the Recycle Equipment Test Facility (RETF) for reprocessing spent fuel from the Monju fast breeder reactor, planned to be built adjacent to the plant, only the buildings have been completed, so it is said they will be used for packing vitrified waste into shipping canisters.

Completion of Rokkasho Reprocessing Plant Postponed

Japan Nuclear Fuel, Limited (JNFL) has announced that completion of the Rokkasho Reprocessing Plant building in Rokkasho-village, Aomori Prefecture, which it previously extended from December 2013 to October 2014, has been delayed a further year and five months as of the end of October, to March 2016. In fact, even when only counting the period after construction began, this is the 18th time completion has been delayed. Conclusion of a safety agreement with the local municipality and the beginning of operations was planned for no later than September 2016.

At a press conference on October 30, Kenji Kudo, president of JNFL, said that there was strong determination to complete the work this time, but added that uncertainties could not be ruled out.

Early Decision Sought on Operating Reactors Past 40 Years

As noted in the previous issue of News Watch, application for restarts of nuclear reactors exceeding or about to exceed 40 years of age, as measured from the official inspection prior to commercial operation, are to be made in April to July 2015.

Prior to that, they must meet the new regulatory standards, and if the time limit is not kept in mind, the deadline will be exceeded and approval will be denied. The NRA issued a directive on October 15 to Japan's eleven electric power companies that own or are building nuclear power plants, urging them to hasten their decision on whether to continue operating or to decommission these reactors. On October 17, Yuko Obuchi, then Minister of Economy, Trade and Industry, requested a speedy decision from Federation of Electric Power Companies Chairman Makoto Yagi (also president of Kansai Electric Power Company).

Interim Waste Storage Bill before the Diet

The Act on Revision of the Japan Environmental Safety Corporation, which will determine interim storage facilities for radioactive decontamination waste in Fukushima Prefecture, was approved at a cabinet meeting on October 3 and submitted to the Diet. The bill calls for changing the name "Japan Environmental Safety Corporation," a special company wholly owned by the government involved in treatment of polychlorinated biphenyl (PCB) waste, to "Interim Storage and Environmental Safety Corporation," which will handle interim storage of decontamination waste.

It also specifies that the waste will be transported out of the area within 30 years of the start of the storage and taken to final disposal facilities.

Two Bills Related to CSC Approval come before Diet

Two bills related to ratification of the Convention on Supplementary Compensation for Nuclear Damage (CSC) were approved by the cabinet on October 24 and submitted to the Diet. One of the bills is the Act on Supplementary Compensation of Nuclear Damage Upon Enforcement of the Convention on Supplementary Compensation for Nuclear Damage, which would collect funds from nuclear power companies to enable them to be prepared at any time to cover damages as needed under the CSC, which requires signatory nations to provide a set amount of compensation for damages exceeding a certain amount. It is meant to help cover part of the costs in case an accident occurs in Japan that requires nuclear power companies to provide compensation for damages. The other bill is the Act on Partial Revision of the Law on Nuclear Damages Compensation and the Law on Contracts on Insurance for Nuclear Damages Compensation. It proposes several revisions for consistency with the CSC.

EUR Certification of Mitsubishi Heavy Industries' EU-APWR

Mitsubishi Heavy Industries announced on October 27 that it had had been awarded European Utility Requirements (EUR) certification for its new large-size reactor, 1,700 MW EU-APWR, the first time for a Japanese company to achieve such recognition. The company says it will strengthen its sales activities in Europe for the 1,100 MW ATMEA-1, developed by ATMEA, its joint venture with the French company AREVA, as well as for the large reactors it has developed on its own. It has already tendered a bid for the Unit 4 reactor at the Olkiluoto NPP in Finland.

Nuke Info Tokyo is a bi-monthly newsletter that aims to provide foreign friends with up-to-date information on the Japanese nuclear industry as well as on the movements against it. It is published in html and pdf versions on CNIC's English website: http://cnic.jp/english/

Please write to us at cnic@nifty.com if you would like to receive email notices when new editions are published.

Editor: Nobuko Tanimura
Translators: Tony Boys, Sumie Mizuno, Mayumi Nishioka, Pat Ormsby
Proofreaders: Tony Boys, Yukio Yamaguchi, Hajime Matsukubo