

# NUKE INFO TOKYO

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Citizens' Nuclear Information Center

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## Fukushima Evacuees Abandoned by the Government

*Evacuation orders for nearly all the areas evacuated were rescinded in March 2017, and at the same time, provision of housing was discontinued for evacuees from areas with no current evacuation orders. In this situation, what are the evacuees thinking and how are they leading their lives?*

*Investigations at several municipalities have revealed conditions of impoverishment. The Cooperation Center for 3.11, where the author serves as a facilitator, has also been receiving calls for help. This article gives an overview.*

### Repatriation Not Progressing Even After Evacuation Orders Lifted

The number of evacuees from Fukushima Prefecture peaked in May 2012 at 164,865 people, and has continued to decline since then, reaching about 55,000 as of October 2017<sup>1</sup> (see Fig. 1 at <http://www.cnic.jp/english/wordpress/wp-content/uploads/2018/03/Mitsuta-sanFig1-ENG.pdf>).

Evacuation orders for all zones except the “Areas where it is expected that residents will face difficulties in returning for a long time” were lifted on March 31 or April 1, 2017, covering areas in Tomioka, Namie, Kawamata and Iitate. Many residents of these areas, however, oppose the lifting of the evacuation orders or view it negatively, and many will not return even though they are legally permitted to do so.

Even though the evacuation orders have been lifted, no more than a fraction of the residents are returning, in some cases leading to areas with a sprinkling of households consisting of one or two aged persons. As of August 2017, the ratios of inhabitants to the total population (returned residents plus in-migrants) were 3.2% for Tomioka, 2.7% for Namie, 10.3% for Iitate and 30.1% for Yamakiya in Kawamata<sup>2</sup> (see Table 1).

Many of the evacuees make do by using the rental housing system based on the Disaster Relief Law (theoretically). The provision of rent-free housing under this system was discontinued in March 2017. This discontinuation applied to about 26,000 people who had evacuated from areas not under evacuation

Table 1: Return rate for Evacuees

	Population (A)	Inhabitants (including in-migrants) (B)	Inhabitant households	B/A
Tomioka	13,228	429	298	3.2%
Namie	17,981	490	338	2.7%
Iitate	5,880	607	320	10.3%
Yamakiya, Kawamata	946	285	126	30.1%

orders from the government (the so-called “voluntary evacuees”).

It is thought that many evacuees have returned despite hoping to continue their evacuation. One of the stated aims of Fukushima Prefecture’s comprehensive plan (revised in December 2012) is for there to be zero evacuees by 2020, implying that reducing the number of Fukushima’s evacuees is being considered a barometer of progress toward recovery. Under these conditions, lifting the evacuation orders and discontinuing the provision of housing for voluntary evacuees is definitely putting undue pressure on them to return.

Fukushima’s population is decreasing. From 2,024,401 people on March 1, 2011, it had fallen to 1,885,709 as of June 1, 2017. That is a decline of 138,692, with women accounting for two-thirds of the number (89,389). In terms of population decline between 2010 and 2015, Fukushima ranks second in Japan.<sup>3</sup> It is unclear how much of this decrease is the result of the earthquake disaster and the Fukushima Daiichi nuclear accident, but being an evacuee gave some a reason to simply stay where they were if they had evacuated outside the prefecture, and it is thought that quite a number of them transferred their residence registry. The number of households, on

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1. Fukushima Pref., *Fukushima Fukko no Ayumi (Progress in Fukushima's Revitalization)*, Nov. 20, 2017.

2. “Half a Year after Lifting Evacuation Orders: Returnees Mostly Aged, Urgent Need for Nursing Care and Living Environment Maintenance,” *Kahoku Shimpo*, October 14, 2017.

3. According to Japanese statistical data from “Chapter 2, Population and Households” by the Statistic Bureau, Ministry of Internal Affairs and Communications, Fukushima’s population decreased by 5.7% from 2012 to 2015, a decline rate second only to Akita Prefecture’s. Japan’s nationwide average population decline was 0.8%. Incidentally, Miyagi and Iwate prefectures, also affected by the disaster, suffered lesser declines of 0.6% and 3.8%, respectively.

the contrary, has increased by 24,233, suggesting that households have split up.

### Lawsuit in Yamagata to Expel Voluntary Evacuees

As noted above, provision of housing to voluntary evacuees, numbering about 26,000 people, was discontinued in March 2017, and many of these people currently residing in public housing or rented accommodations have no choice but to leave them. Even so, 78% of evacuees living outside Fukushima Prefecture have decided to continue their evacuation.<sup>4</sup>

In the midst of that, Fukushima is providing a small amount of rent assistance to households below a certain income threshold (a maximum of 30,000 yen/month for the first year, decreasing to a maximum of 20,000 yen/month for the second). The municipalities are providing their own kinds of support such as establishing exclusive frameworks for public housing. Still, a number of conditions have been set, such as income limits and household prerequisites, and many people slip through the cracks there.

Among them, there are evacuees who have been living all along in public housing who are still there because they do not agree with discontinuation of the provision of housing, or they cannot find housing to move into, or even if they do find it, they cannot afford to pay the rent on it.

In September 2017, the independent administrative institution Japan Organization for Employment of the Elderly, Persons with Disabilities and Job Seekers, which undertakes management and operation of employment promotion housing, requested eight households in employment promotion housing in Yamagata Prefecture to vacate their housing units and pay up their unpaid rent. The Organization has filed a lawsuit against the households in the Yamagata District Court Yonezawa Branch. Three of the eight households were single-parent mother and children evacuees facing economic hardship.

At a press conference, Toru Takeda, who had evacuated from Fukushima City, appealed, saying, "If burdened with rent payments, single-mother evacuees with children cannot make ends meet. They face severe economic distress... It is not that they wanted to evacuate from Fukushima. The responsible parties, the country and TEPCO, should pay."

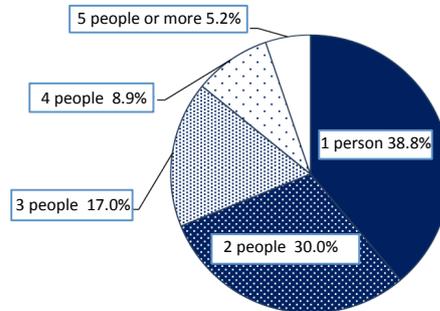
### Impoverished Evacuees: from Surveys by Municipalities

What kinds of lives do nuclear accident evacuees lead, and what kinds of troubles do they have? The national government has not conducted a survey to get a grasp of that despite repeated requests for it to do so, but several municipalities have managed to gain some insights into the situation.

The government of Tokyo, where the largest number of evacuees are living, conducted a questionnaire survey in May 2017<sup>5</sup> (targeting evacuees living in Tokyo; including evacuees from within areas to which evacuation orders had been issued, evacuees from

outside those areas, and evacuees from prefectures other than Fukushima). They found that households whose head of household was aged 60 or over accounted for more than half of the total, that there was a large proportion of single-person households (see Fig. 2) that was still increasing, and that 47% of the total were unemployed.

Fig. 2 Numbers of people in evacuee households in the Tokyo metropolitan area (n=829)

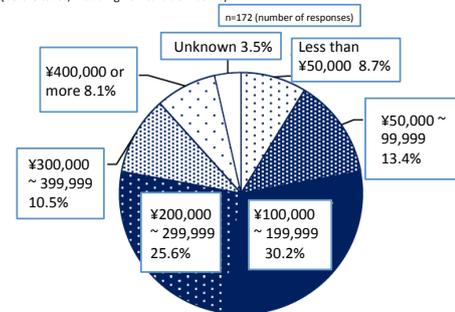


Source: Tokyo Metropolitan Government, "Results of questionnaire survey of evacuees in Tokyo," May 2017.

The Tokyo Metropolitan Government conducted a questionnaire survey of voluntary evacuees, who lost their housing provision in March 2017<sup>6</sup>. The results of that survey have made the following points clear.

- Households with monthly earnings of 100,000 yen or less (about \$950) accounted for 22%, and more than half had monthly earnings of 200,000 yen (about \$1,900) or less. (See Fig. 3)

Fig. 3 Monthly household income of voluntary evacuees living in Tokyo (before taxes, including non-taxable income)



Source: Tokyo Metropolitan Government, "Results of questionnaire survey of evacuees from Fukushima Prefecture for whom the provision of temporary emergency housing ended at the end of March 2017," October 11, 2017.

- 36% responded that they "strongly felt" the protracted evacuation to be physically and mentally taxing.
- 12% responded that there was "nobody" they could contact or consult with on a daily basis.
- One or two-person households accounted for a large portion; about 34% each.

A survey of evacuees to Niigata Prefecture<sup>7</sup> as part of that prefecture's review of nuclear accidents, also clarified the following points.

- The number of people comprising households decreases as a result of evacuation. The number of single- or two-person households increased (from a combined 32.4% before the disaster to 50.2%

4 Data from Fukushima Prefecture Living Base Department, April 2017.

5 Tokyo Metropolitan Government, "Results of the 6th questionnaire survey of evacuees in Tokyo," May 2017. <http://www.metro.tokyo.jp/tosei/hodohappyo/press/2017/05/01/11.html> (in Japanese)

6. Tokyo Metropolitan Government, "Results of the Questionnaire Survey of Evacuees from Fukushima Prefecture for whom Provision of Temporary Emergency Housing Ended at the End of March 2017," October 11, 2017 <http://www.metro.tokyo.jp/tosei/hodohappyo/press/2017/10/11/13.html> (in Japanese).

at present), while the number of households with three people or more decreased (from a combined 67.5% before the disaster to 49.9% at present). (See Fig. 4 at <http://www.cnic.jp/english/wordpress/wp-content/uploads/2018/03/Mitsuta-sanFig4.pdf>)

- Households with three generations residing together also declined greatly (15.3% before the disaster to 6.4% at present), revealing conditions that split families apart in the process of evacuating.
- Evacuation caused a decrease in regular employment as well as the numbers of self-employed and family workers and an increase in non-regular employment, including part-time work, and unemployment.
- As a result of the evacuation, the average monthly income of the evacuees decreased by 105,000 yen (falling from 367,000 yen before evacuation to 260,000 yen), while their average monthly expenses remained high (from 262,000 yen before evacuation to 260,000 after). They get by in their lives on work income, savings and compensation (for those from extant evacuation zones).
- The majority of evacuees have found that their relationships and bonds with long-time friends and acquaintances have grown weaker, their neighborhood or regional ties have diminished, or they have so few friends that they have become isolated. In all cases, the numbers of evacuees reporting such circumstances who are from non-evacuation zones exceeds those of evacuees from evacuation zones.

### An SOS from the Evacuees

Many hard-pressed evacuees have been calling on the Cooperation Center for 3.11 (in Tokyo), which was established in July 2016 to aid evacuees. They consult with us about their housing and lives. Examples of consultation include the following.

<Prior to the March 2017 housing provision cut-off>

- Even if they move, they cannot cover rent.
- They want to move into public housing provided by the municipality, but have had to give up due to strict tenant requirements that are a barrier.
- They feel uneasy about changing their children's schools, commuting to work or living in places to which they are unaccustomed. They want to continue living in the same place if they can.
- They are facing financial difficulties in daily life and are relying on public assistance. They tried applying for private housing rent assistance from Fukushima Prefecture (maximum of 30,000 yen for the first year), but had their application rejected because they met life insurance income certification criteria.
- A mother and her child evacuated to employment promotion housing, but the mother is in the middle of divorce mediation. The mother is also receiving treatment for an illness and is on a disability allowance. Her child is entering

a higher-level school, so they want to remain in employment promotion housing for one or two more years. Essentially, until her divorce is confirmed, her husband's income is counted. Her household income therefore exceeds the criteria, so she cannot receive rent assistance for moving into public housing.

<Following the housing provision cut-off>

- Facing intensified financial hardship, people have turned to us over trouble paying rent or even called for help because almost all their money is gone.
- They applied for public assistance, but encountered barriers to assistance such as rejection on account of car ownership (they needed the car because of their double existence in and out of Fukushima, or because of difficulty with mobility due to illness); or because the rent for the housing to which they evacuated is unsuitable so they need instructions on relocation; or because if they applied for it, they would lose their qualification for public housing assistance, but could not cover rent on public assistance alone.
- There was also a heartbreaking case of a woman whose husband had been abusive to her, so she and her children evacuated without him. Living in a "double world," she was putting her children through school, and was just about to be approved for continued residence in employment promotion housing when she lost her mental balance and killed herself.

Surveys by municipal governments and calls to support organizations have made it clear that not only do the evacuees face economic destitution, but their family sizes decrease, they lose their ties with their friends, acquaintances and communities, and not a few of them wind up isolated. There are some who are so hard pressed mentally that they take their own lives. There are also limits to support by private citizens.

### Organization of a System for Aiding Evacuees Needed

The Nuclear Accident Children and Victims Support Law which came into effect in 2012 requires the national government to provide appropriate aid regardless of whether disaster victims elect to stay, evacuate or return. Article 9 of this law clearly states that housing is to be ensured at their place of refuge. In October 2013, the government incorporated "smoother acceptance of occupancy in public housing" among the basic principles of this law, allowing conditions regarding income and difficulty finding housing to be relaxed for evacuees moving into public housing, but specific measures were left up to the municipalities. Legislative, systematic and enforcement systems to help evacuees need to be prepared rigorously as part of the responsibility of a government promoting a nuclear energy policy.

<Kanna Mitsuta, FoE Japan>

7 Data presented at the second meeting of the "Livelihood Subcommittee" of the Niigata Prefectural Committee to Verify the Effects of the Nuclear Accident on Health and Life (held on December 23, 2017) from a questionnaire survey of 1,174 households that had evacuated within Niigata Prefecture or were once evacuees to Niigata Prefecture but are currently living in other prefectures, plus 192 adults and 122 junior high or high school students who were not the head of a household

## Fukushima Now

# On the Eighth Spring Since the Accident – Living in a world full of contradictions

### Report on Fukushima Prefectural People's Rally

On March 17, 3,300 people participated in the “2018 A Fukushima Without Nukes! Prefectural People's Rally” held at Tenjin Misaki, Naraha Town. Large numbers of people gathered from all over Japan to what was a designated evacuation zone until September 2015. This place was chosen from a feeling of wanting people all over the country to actually see the severe reality that has been brought about by the nuclear power station accident. But, as well as the location being inconvenient from the viewpoint of transportation, I also heard that some people were opposed to this location because it could be seen as supporting the government stance of trying to show that 'restoration' is proceeding smoothly and people should move back to their homes. The air dose rate on the extensive lawn at the venue, while it differed from place to place, was 0.09-0.13 microSievert/hour, which is not a value to be lightly dismissed.

Following the Executive Committee Chairperson Masashi Tsunoda's greeting, Mr. Satoshi Kamata said he felt depressed by the difficulties facing the people of Fukushima and frustrated by the inability to topple the government that is still trying to push nuclear power. Ms. Ruiko Muto expressed her sentiment that living in the world after the nuclear accident was to live in a world without human rights and filled with contradictions and that she would like to live with sincerity that would connect up with the life we would live in the future. Ms. Harue Sanpei, a former resident of Tsushima District, Namie Town,

is a plaintiff in the “Give us Back Our Hometown – Tsushima People displaced by the Nuclear Power Station Lawsuit” spoke of her heartache at having her ten-member, four-generation family being torn apart. Representing the young generation, two high school peace ambassadors, now in their 20s, declared their determination to spread the message of the realization of the abolition of nuclear weapons and a steady movement toward peace.

### Lest we Forget

In February, I heard a report on the situation regarding Fukushima Prefecture's radiation education at a nation-wide meeting on educational research. In a sixth grade class, the topic of “cancer” was taken up as an example of how radiation can impact the human body. Knowing that there is a fear that cancer will lead to death, it was said that in consideration for “school children whose anxieties about radiation are fading” the “children who feel worried” should be told that there was no reason for them to be over-concerned. This resulted in a ‘difficult’ attempt at a class where I felt the teachers should have been more aware of the contradictions involved.

According to the results of a questionnaire conducted before the class, 60% of children responded “I don't know why there is a lot of radiation in Fukushima” and 40% responded “There's nothing in particular that I want to learn about radiation.” 80% responded that “Regarding caution about radiation, I'm not concerned about it/I'm not concerned about it at all”.

At the time of the disaster, these students were five-year-olds at kindergarten. They may remember something, but probably no one has continued to talk to them about it. The report concluded that we will now have to teach this properly as history.

### A Place to Talk Things over Freely

“We want to prevent additional exposure to children; in the first place, how much radiation were they exposed to at the time of the accident?” This is what I was told when I had an opportunity to listen to mothers who are active in Iwaki City. “Because the plume containing massive amounts of radioactive iodine, that was released into the environment by the nuclear accident, passed over Iwaki City, the people there are at a high risk of thyroid cancer and other



*Ruiko Muto speaks at the Fukushima Prefectural People's Rally  
<Photo by Ryohei Kataoka, CNIC>*

problems. Quite surprisingly, however, this is not well known by the citizens here.” This is from a group of mothers who have a testing lab and instruments for measuring the air dose rate and the concentration of radiation in the soil. They know the figures for radiation levels, they speak out and are concerned about countermeasures.

“What is disturbing is that the higher-ups at school and in the administration are saying that there’s no problem about the impacts of radiation and don’t rock the boat. In society, the men tend to fall into ‘business-as-usual’ mode, but as mothers we find it impossible to suppress the never-ending anxiety about our children’s future. Above all, we want a place where we can freely talk about our concerns. A place where we

can thoroughly talk through the problems we are not happy about, and we want experts who will explain things to us in terms we can easily understand.”

“Since we live in a system where experts in the field are ‘guaranteed’ to tell us the truth, we end up trusting them. But the experiences of 3/11 showed us that this attitude was a mistake. We shouldn’t have left things in other people’s hands. What we are saying about ‘the freedoms and rights guaranteed to the people shall be maintained by the constant endeavor of the people’ is stated in Article 12 of the Japanese Constitution, but it seems our awareness of this was extremely deficient.”

<Yukio Yamaguchi, CNIC Co-Director>

## Current State of Post-Accident Operations at Fukushima Daiichi Nuclear Power Station (July to December 2017)

### State of the Plant

From the water temperature in the containment vessels and the spent fuel pools (SFPs), and from the state of releases of Xenon-135, released when uranium fuel undergoes fission, and other measurements, it can be estimated that the state of the reactors is stable. Further, according to an assessment by TEPCO, around 87,000 bequerels per hour (Bq/h) of radioactive materials were being released from the buildings as of December 2017 (See Fig.1 at [http://www.cnic.jp/english/wordpress/wp-content/uploads/2018/03/201803\\_F1\\_emission.jpg](http://www.cnic.jp/english/wordpress/wp-content/uploads/2018/03/201803_F1_emission.jpg)).

The situation regarding the removal of spent fuel from the SFPs is summarized in Table 1. With the exception of Unit 4, from which spent fuel removal has been completed, all SFPs are currently undergoing pre-removal preparation work.

Table 1 State of Spent Fuel Pool Cleanup	
Unit	Overview
Unit 1	After removal of building cover, installation of a windbreak fence was completed on December 19. Debris removal work is ongoing.
Unit 2	Installation of gantry for access to operating floor and preparations for installation of exterior wall aperture ongoing. Removal work on debris, etc. on roof completed by December 25.
Unit 3	Installation work begun on cover, etc. for removal of nuclear fuel in July.
Unit 4	Completed (December 22, 2014)

### State of contaminated water

Contaminated water countermeasures at Fukushima Daiichi Nuclear Power Station (FDNPS) can be broadly divided into three areas: 1) Reduction of

groundwater flowing into buildings, 2) Reduction of contaminated water flowing into the sea, and 3) Reduction of the toxicity of contaminated water.

Regarding the reduction of water volumes flowing into buildings, the main countermeasures are, from higher elevations downward, A) Pumping up groundwater at the ground water bypass and releasing it into the sea (331.310m<sup>3</sup> up to November 27), B) Installation of a frozen earth barrier (on-land water barrier, total length roughly 1,500m) surrounding FDNPS Units 1-4. (Closure of the remaining unfrozen section of 7m was begun on August 22 and completed on November 3.) C) Pumping up water at the subdrains and releasing it into the sea (460,076m<sup>3</sup> up to November 27), and D) Paving of the site with asphalt to suppress permeation of rainwater into the soil.

Regarding reduction of contaminated water flowing into the sea, the countermeasures being taken include A) Groundwater leakage prevention by a steel water barrier on the sea side, B) Pumping up of groundwater dammed up behind the sea-side water barrier from the well points and groundwater drains. (164.000m<sup>3</sup> up to November 28; as this groundwater is highly contaminated, it is being transferred to the turbine building), and C) Countermeasures against leaks in the tank areas, where contaminated water is being stored.

Due to these countermeasures, volumes of groundwater flowing into buildings has been reduced from an original 400m<sup>3</sup>/day to 140m<sup>3</sup>/day (average volumes from December 2012 to January 2018, including volumes transferred). According to the medium to long-term road map revised in June 2015, the volume of water flowing into buildings was to be suppressed to 100m<sup>3</sup>/day or less in FY2016, but as the current medium- to long-term road map calls for suppression of the contaminated water volume to be around 150m<sup>3</sup>/day during FY2020, it can be said that the goal has been attained. However, there are still

various doubts about the effectiveness of the frozen earth barrier.

Regarding the reduction of the toxicity of contaminated water, measures taken at present are mainly A) Removal of cesium and strontium from contaminated water in buildings using cesium adsorption devices, and B) Treatment of contaminated water already treated by the cesium adsorption devices in ALPS (Advanced Liquid Processing System). The contaminated water storage situation is ALPS-treated water: 842,715m<sup>3</sup>, water treated by cesium adsorption devices, etc.: 188,751m<sup>3</sup>, water treated by reverse osmosis (RO): 12,663m<sup>3</sup>, concentrated brine: 700m<sup>3</sup>, Units 5 & 6 tanks: 15,618m<sup>3</sup>, water stored in buildings: 56,037m<sup>3</sup>, and other contaminated water: 21,621m<sup>3</sup>.

**Table 2 Removal Performance Assessment of Additional ALPS System A (Excluding ND)**

Unit: Bq/cc	NC*	Before	After
Sr-90	0.03	160	0.0002
Y-90	0.3	160	0.0002
Tc-99	1	0.021	ND<0.0019
Ru-106	0.1	0.15	0.0062
Rh-106	300	0.15	0.0062
Sb-125	0.8	1	0.00069
Te-125m	0.9	1	0.00069
I-129	0.009	0.019	0.0081
Cs-134	0.06	0.26	0.00023
Cs-135	0.6	0.00001	0.0000000041
Cs-137	0.09	1.5	0.00065
Ba-137m	800	1.5	0.00065
Co-60	0.2	0.089	0.0017
Ni-63	6	0.11	ND<0.017

Note: From "Results of Analysis of Water Treated by Additional ALPS", November 2, 2016.

\*NC=Notification Concentration

As of December 14, 921 tanks had been installed on the site (of which 154 are flange-type tanks) and TEPCO plans to have a total capacity of 1.37 million m<sup>3</sup> installed by 2020. However, as the upper limit of storage capacity will be reached around 2023-2024 if additional volumes of contaminated water continue to increase at the current rate, it is said that further installment of tanks will require the removal of existing buildings.

### Tritium-contaminated water

TEPCO, the government and the Nuclear Regulation Authority (NRA) are calling water treated by ALPS 'tritium water'. Nuclides remaining in contaminated water after ALPS treatment are summarized in Table 2. While TEPCO stated in July 2017 that it had finalized the decision to release the tritium-contaminated water

into the ocean after diluting it with seawater to below the notification concentration (60,000 bequerels/liter), when faced with local opposition the company later said that it had not reached a final decision. The Agency for Natural Resources and Energy set up a task force on tritium-contaminated water to consider five types of disposal methods, stratum injection, ocean release, steam release, hydrogen discharge, and subsurface burial. On this basis, a subcommittee on the handling of water treated by ALPS is now considering the matter.

At the same time, NRA is actively pushing dilution disposal. Attempting to compel local people to accept TEPCO's decision, Chairperson Toyoshi Fuketa stated in a meeting with Iitate Village Mayor Norio Sugano in December that "there is no other option but to dilute [the tritium-contaminated water] and release it into the ocean."

However, with the Citizens' Commission on Nuclear Energy (CCNE) advocating storage of the tritium-contaminated water in 100,000-ton oil storage tanks as an example, it is not as if there were no other options available. The pushing forward of one option by the regulatory authority, thereby exceeding its mandate, is an extremely grave issue when seen from the viewpoint of the neutrality of regulatory work.

### State of radioactive waste materials

On-site waste materials can be broadly categorized into three types. These are solid radioactive waste substances that were generated before the accident, solid radioactive waste materials such as debris that were generated after the accident, and secondary waste generated by contaminated water treatment.

The volumes of waste materials generated after the accident, as of December, were concrete and metal debris: roughly 224,200m<sup>3</sup> (% occupancy ratio (similarly below): 69%), felled trees: roughly 133,700m<sup>3</sup> (72%), protective clothing: roughly 59,900m<sup>3</sup> (84%), waste sludge: 597m<sup>3</sup> (85%), discharged concentrated liquids: 9,319m<sup>3</sup> (87%), and spent vessels and ALPS waste packed in high integrity containers (HIC), etc.: 3,865 containers (61%).

<Hajime Matsukubo, CNIC>

<b>List of Accidents at Fukushima Daiichi Nuclear Power Station, July to December 2017</b> (Excerpts from “NUCIA”, Nuclear Facility Information Disclosure Library and TEPCO website)			
<b>Date</b>	<b>Location</b>	<b>Summary of accident (Bq: becquerels, L: liters)</b>	<b>NI*</b>
Jul 5, 2017	Unit 1 turbine building	In a survey of remaining water in 3 unsurveyed areas where there was the possibility of accumulated water remaining on the first basement level of Unit 1 turbine building, when the water level was measured (two locations) in electrical manholes, both locations were found to have water levels higher than those in subdrains nearby the Unit 1 turbine building. A drainage pump was set up and water drained from inside the manholes to the Unit 1 turbine building floor drain sump.	
Jul 21	Additional ALPS	Water was dripping from the valve lagging material on the sampling pipe on the additional ALPS System B in the additional ALPS building. No external leakage.	
Aug 2	Subdrain	Temporary drop in water level in subdrain pit No.51, southwest of Unit 4 reactor building. Judged at the time to be a failure of the water level gauge, onsite measurement and water level gauge values matched. Due to the drop in water level, there was a time zone when water retained in the Unit 4 reactor building, etc. exceeded that of the subdrain water level. However, the subdrain water level returned to a level higher than that of the water retained in the Unit 4 waste treatment building 23 minutes later. Measurement of radioactive substances in water in surrounding subdrains found no significant change.	
Aug 16	ALPS	Leakage in existing ALPS System A circulation pump 1A exit subdrain valve. No external flow.	
Aug 30	Dry casks	When loading spent nuclear fuel stored in the common spent fuel pool (SFP) into casks for storage and transport, 4 fuel assemblies containing spent fuel (recovered uranium fuel) were loaded without checking whether they were to be loaded or not. The 2 casks in question were returned to the common pool from the temporary cask storage facility.	
Sep 8	Onsite	At the onsite contamination testing station, it was confirmed that there was contamination in the area of the nostrils of a cooperative company worker who had been working on the demolition of a tank in tank area B. A detailed examination was carried out, confirming contamination in the nostrils. The exposure dose was rated at about 0.01mSv in the case that internal exposure continued for 50 years.	
Sep 19	Unit 4	Water leakage occurred in the reverse osmosis (RO) equipment in Unit 4 turbine building. No external leakage.	
Sep 28	Subdrain	Settings of the water level gauges were inaccurate in 6 locations in a new subdrain pits in the surroundings of the Unit 1-4 buildings. It was found that the actual water level was 709mm lower than the measured water level. Of these, in 1 location, during the period from the start of use of the gauge on April 19, 2017 to September 29, 2017, the water level had been a maximum of 19mm lower than the water level of the water retained in the Unit 1 waste treatment building (a state of reverse water level) at least 8 times. The result of testing of subdrain water in subdrains nearby the building all showed that values were within the standard.	
Oct 18	Units 5, 6	Water leak from the Unit 5, 6 retained water treatment device (additional RO device). No external flow.	
Oct 23	Onsite	A JAEA cooperative company worker was stung in the head by a bee in the JAEA analysis research center facility management building (now under construction) and diagnosed as suffering bee-sting anaphylaxis	
Oct 30	Unit 6	When starting the Unit 6 emergency diesel generator (D/G) A (hereafter “D/G6A”) for a regular test, it was not possible to connect to the power supply system (4 D/Gs are installed in Units 5, 6, D/G5A & B and D/G6A & B). As the D/G6A rotational speed (frequency) operation could not be carried out, it was judged that the speed control device had failed. The D/G was returned to standby status on November 14 after completion of a check by the maker.	✓
Nov 15	Temporary storage area N	It was confirmed by the 2nd security check for FY2017 that in the temporary storage area N, a temporary storage area for debris, etc., 1) contaminated earth retrieved onsite had been provisionally placed in the area without loading into metal containers and without obtaining confirmation from within the company and 2) inappropriate provisional placement in the same area had not been pointed out in a patrol.	
Nov 20	Unit 2	After stopping Unit 2 reactor pressure containment vessel (PCV) gas management device system A for maintenance work, an abnormality occurred in PCV gas management device system B, making it impossible to monitor the concentration of radioactive short half-life nuclides. It was later confirmed that the concentration of radioactive short half-life nuclides could be monitored after operating the valve fitted on the Unit 2 PCV gas management device system B pipe.	
Nov 27	Unit 3	The Unit 3 spent fuel pool primary system cooling circulation pump (B) stopped during operation. It is presumed that position detection switch on the pump system inlet isolation valve had come into contact with something during work, causing the automatic halt.	
Dec 21	H9 tank area	It was confirmed that a nail had pierced the hose for transferring water from the rainwater retrieval tank and that water was leaking from it. The leak location was outside the retention wall and the leaked volume was 0.9L (Cs-134: ND (detection limit: 0.57Bq/L), Cs-137: around 1.1Bq/L, total beta radiation: around 107Bq/L).	
Dec 26	G3 north tank area	Water leaked from a transfer hose during work to withdraw the water from a contaminated water tank. The leaked water was retrieved.	

\*NI: Notification Incident (Incident requiring notification to authorities)

# Application for Monju's Decommissioning Schedule

Application for approval of the planned schedule for the decommissioning of Monju has been submitted to the Nuclear Regulation Authority (NRA). In this article we give an overview of the planned schedule and the associated problems. According to the media, NRA will approve the schedule as early as sometime in March and decommissioning will begin around July.

## Site reclamation will cost over 375 billion yen

Site reclamation will be carried out over 30 years by dividing the work into four stages (see Table 1). The first task to be implemented will be removal of the fuel assemblies. The delineations of the second and subsequent stages are approximately defined, but no specific years have been given for the initiation of these stages. These will be determined before completion of the fuel assembly removal, which is scheduled for 2022. The reason for leaving the dates open at this stage is unclear. As NRA is making strong demands for the quick removal of the secondary system sodium, the Japan Atomic Energy Agency (JAEA) plans to remove the sodium from the three loops of the secondary system in 2018, i.e. this year. In fact, renovation work was carried out for about two years from 2007 as a measure against a sodium leak accident, all the secondary system sodium being removed at that time to implement the task. The volume (40m<sup>3</sup>) of the existing sodium drain tank is insufficient, and JAEA is to design and manufacture a new tank and install it in the reactor auxiliary building. Further, machinery in the steam system was dismantled and put into storage at the time when the December 1995 sodium leak accident resulted in long-term shutdown.

The total amount of solid radioactive waste from the decommissioning will be 26,700 tons. This includes waste which is not required to be handled as

radioactive material (because it is below the clearance level), but does not include sodium. The total amount of sodium in the primary and secondary systems amounts to around 1,700 tons.

The decommissioning costs are assessed as 150 billion yen. According to media reports, an additional 225 billion yen is needed for maintenance and management of facilities. Moreover, additional costs, not included in the above, must be added on to meet the new regulatory standards. It is said that buildings, etc. are to be demolished and removed, but this demolition refers to buildings, etc., "other than underground buildings that have been confirmed not to be contaminated with radioactive substances, underground structures and building foundations." If these are included, costs and waste volumes would further increase. This will also influence how the vacated site is eventually used.

It is thought that the reason why the plan has not been firmly drawn up from the second stage onward is that it has not yet been decided how the spent fuel and sodium will be handled. Fukui Prefecture is demanding that all the fuel, sodium and waste material be removed from the prefecture.

## Removal of fuel assemblies

Stored at Monju are the spent fuel assemblies, fresh fuel assemblies, both fresh and used blanket fuel assemblies as well as experimental fuel assemblies (all referred to as "fuel assemblies" below). The amounts of these and the storage locations are summarized in Table 2. Besides these, 42 fresh fuel assemblies and 66 fresh blanket fuel assemblies are stored off-site. Storing all these fuel assemblies in a water-cooled fuel pool is the task of the first stage and is reckoned to take around five and a half years. The procedure will be 1) Transfer of fuel assemblies from the ex-core fuel storage tank (containing liquid sodium) to a fuel pool,

Table 1. Outline of planned schedule for the decommissioning of Monju

	Stage 1	Stage 2	Stage 3	Stage 4
	Spent fuel removal	Preparation for demolition	Decommissioning period 1	Decommissioning period 2
Year	By 2022	2023	~	2047
	Fuel removal	Preparation to dismantle sodium equipment	Sodium equipment dismantling and removal	Demolition and removal of buildings, etc.
	Radiation survey and assessment		-	-
Main tasks	-	Power generation equipment, etc. dismantling and removal		-
	Processing and disposal of solid radioactive waste			

Table 2. Number of fuel assemblies and storage location

Storage location		Type and number of fuel assemblies				
		Fresh fuel		Spent fuel		
		Core fuel assemblies	Blanket fuel assemblies	Core fuel assemblies	Blanket fuel assemblies	Experimental fuel assemblies
In reactor building	Core	33	0	165	172	0
In reactor auxiliary building	Fresh fuel storage racks	4	2	-	-	-
	Ex-core fuel storage tank	-	34	116	2	8
	Fuel pool	-	-	1	1	0

and 2) transfer of fuel assemblies from the reactor core to the ex-core fuel storage tank. 1) and 2) are to be repeated four times until all the fuel assemblies have been stored in the fuel pool

When removing the fuel assemblies from the core, “mock” (empty) assemblies will be substituted for those removed. As the Monju fuel assemblies are fixed at the lower end, but not at the upper end, if mock assemblies are not inserted there is a possibility that some fuel assemblies will not maintain their correct position as removal progresses, making their removal impossible. Originally, mock assemblies were to be substituted for all the fuel and it was stated that the manufacture of new mock assemblies would be needed for this. However, this plan was later amended and the number of assemblies to be substituted has been reduced. This reduction is said to be based on an assessment which was carried out to determine how many fuel assembly replacements would be necessary to ensure that assemblies would not shift out of their correct position during the removal process.

Further, it was also said that to prevent the fuel coming into direct contact with water, the assemblies would be inserted into canisters for storage in the fuel pools, but this plan has been basically abandoned. However, since the number of fuel racks is limited, racks for canister use will be employed. Some of the assemblies will therefore be inserted into canisters for storage.

Fuel assemblies removed from liquid sodium will have sodium attached to them. This must be removed before the assemblies are placed in the fuel pool. This is achieved by using steam and water.

JAEA says that the liquid sodium level in the reactor core will be maintained until fuel removal is completed. Therefore, as the fuel assemblies are removed, sodium will have to be added to take up the volume that is not filled by mock assemblies. In this situation, it is possible that the remaining fuel assemblies may shift, in an earthquake, for example. In a seismic backcheck conducted in 2010, assessment of the vertical movement of the assemblies due to an earthquake showed that there was an extremely small safety margin (38mm movement for an allowable 40mm). The premise of this assessment was that the core contained a full load of fuel assemblies, but in the case that some of the assemblies are missing, there is a fear that the fuel assemblies will shift or topple

over, resulting in inability to remove them. The reason is that the positions of fuel assemblies is controlled by computer. It can be said that the failure to conduct such an assessment is a serious deficiency.

Further, because an accident of this nature could occur, an assessment regarding criticality safety is also necessary. There is a fear that a severe accident may occur, in which case public exposure to radiation is inevitable. If fuel assemblies cannot be removed, it is thought that it may become necessary to conduct a fundamental review of the decommissioning schedule plan, e.g. prioritizing the removal of the primary system sodium.

#### What!? Reprocessing?

JAEA has stated that the policy of the government when it made the decision to decommission Monju was to either recycle or sell the sodium, but the application says that the handling and disposal of the sodium will be “finally determined by the government” before the time when removal of the fresh fuel assemblies has been completed. At the same time, spent fuel “will be reprocessed in Japan or in a country that has signed an agreement for cooperation on the peaceful uses of atomic energy,” the specific plan and method being finally determined by the government by the end of stage one. The policy for fresh fuel is to transfer it to domestic dealers. This will be reflected specifically in the application when the government’s final decision is made.

However, as there is no reactor core in Japan that uses precisely the same fuel assembly specification, it is thought unlikely that a buyer for the fresh fuel will appear. Furthermore, there is no facility for reprocessing the spent fuel in Japan, and as Monju was developed using Japanese technology, it is uncertain whether the spent fuel can be reprocessed as it is overseas. While there is no prospect for the reprocessing of the spent fuel, making it a matter of policy to reprocess the spent fuel is tantamount to requiring that it be handled in accordance with Japan’s business-as-usual ‘everything must be reprocessed’ policy. Reprocessing should be abandoned and the spent fuel reassessed as radioactive waste.

<Hideyuki Ban, CNIC Co-Director>

# NEWS WATCH

## **Nuclear Zero Bill Submitted to the Diet**

The “Nuclear Zero Bill” drafted by the Constitutional Democratic Party (CDP) of Japan in response to concerns voiced by citizens’ organizations was submitted to the House of Representatives on March 9 by the CDP together with the Communist, Liberal and Social Democratic parties. The Democratic Party did not take part in the submission, but two members who did agree with it joined in.

The bill would have all nuclear power plants in Japan shut down promptly, setting a course for decommissioning, with the necessary procedures performed within five years of the law taking effect. The bill is not expected to pass in the Diet, where the majority of legislators either promote or accept nuclear energy, but Seiji Osaka of the CDP, who heads the Energy Investigation Committee, held a press conference, where he emphasized, “What is important is not just to create legislation, but also to build a national movement.”

## **Energy Proposals by Foreign Minister’s Advisory Panel**

The Advisory Panel of Experts on Climate Change established by Foreign Minister Taro Kono in January and chaired by Takejiro Sueyoshi, Special Advisor to the United Nations Environmental Programme Financial Initiative (UNEP-FI), submitted its proposals on energy to Kono on February 19. The proposals criticized government policies promoting coal-fired energy, saying, “Under criticism from international society, this is beginning to be a bottleneck in Japan’s foreign diplomacy. They called for a shift toward diplomacy that puts a top priority on renewable energy. They also pointed out, “The idea that nuclear or coal-fired energy is needed as a base-load energy source is outdated.”

The proposals cover all aspects of climate change. A summary is due to be released in April.

## **String of Decisions on Fukushima Nuclear Accident Victims’ Lawsuits**

The Tokyo District Court ordered Tokyo Electric Power Co. (TEPCO) on February 7 to pay a

total of about 1.1 billion yen to 318 evacuees for “unprecedented damage from long-term evacuation, violating the victims’ freedom of movement and residence” as a result of their forced evacuation from the Odaka district of Minamisoma City, Fukushima Prefecture.

On February 20, the Fukushima District Court ordered TEPCO to pay 15.2 million yen to the surviving family members of a man (then aged 102) from Iitate Village, Fukushima Prefecture, who committed suicide when faced with forced evacuation. There are two prior cases in which judgements have recognized suits seeking compensation for family members of people who committed suicide during evacuation, but this is the first judgement in a case where the suicide occurred before evacuation. The judgement dismissed TEPCO’s assertion that “it was not a suicide caused by the rigors of refugee life,” saying, “Being forced to evacuate was the ultimate trigger for his suicide, caused by anxiety over being unable to live in his home town.”

Judgments were handed down on March 15 in the Kyoto District Court, March 16 in the Tokyo District Court and March 22 in the Fukushima District Court, Iwaki Branch. In the first two cases, both TEPCO and the national government were ordered to pay plaintiffs additional compensation. Plaintiffs in the Fukushima District Court case, were suing only TEPCO, not the government, but the judgement ordered that TEPCO must pay additional compensation. The ruling stated that, regarding tsunami countermeasures, ‘Even if TEPCO’s awareness was that there was no possibility of mounting realistic countermeasures, such an extreme lack of rationality cannot be recognized.’ The upper limit of compensation was raised slightly.

The second hearing in the criminal case against three former TEPCO executives, including the former chairman, for criminal liability in the Fukushima nuclear accident (compulsory trial; professional negligence leading to death) was held on January 26 in Tokyo District Court, with witnesses who were employed by TEPCO being questioned. The first hearing, on June 30, 2017, was the arraignment (the three defendants pleaded

not guilty) and statement of evidence, and now actual hearings have finally gotten underway. The trial schedule after this is densely packed, so the dates for everything up to the 17th hearing on June 15 have been determined and witnesses will be questioned at each hearing.

Testimony of TEPCO employees at the second hearing and of employees of Tokyo Electric Power Services, a TEPCO subsidiary, at the fourth revealed TEPCO as a company that gave priority to economic concerns and was trying to evade taking tsunami countermeasures.

Further to the data falsifications by Kobe Steel reported in this column of NIT No. 181, on February 14, cheating by Kobe Steel's subsidiary Kobelco Research Institute in its irradiated metal corrosion analysis was revealed. Japan's Nuclear

Regulation Authority (NRA) had entrusted the Japan Atomic Energy Agency (JAEA) with preparing evaluation methods for safety tests with regard to highly radioactive waste disposal. JAEA, in turn, subcontracted this out to Kobe Steel, who passed it along to Kobelco Research Institute.

An outside investigative committee established by Kobe Steel for the above-mentioned investigation of corrosion found mismatches between the original data and the reported figures, and couldn't even find some of the original data. On February 7, Kobe Steel reported to JAEA that an investigation was in progress. JAEA held a hearing for an explanation from Kobe Steel on the 13th, and reported to the NRA on the 14th. The same day, the NRA and JAEA announced that inappropriate actions may have occurred.



The biannual Goodbye Nukes Rally was held in Yoyogi Park, Tokyo on 21 March. Despite falling snow and freezing temperatures, organizers estimated 12,000 people attended, raising their voices against the government's continued policy of promoting nuclear power. Speeches from the main stage included nuclear plant worker Arakabu-san who contracted leukemia and is fighting a courtcase against TEPCO to demand compensation, Lee Kyonja, a Korean activist, as well as a Fukushima evacuee, the former mayor of Tokai Village and Diet members. Hiroyuki Kawai, who is on CNIC's Board of Directors also spoke, representing *Genjiren* (Promotion of Zero Nuclear Power and Renewable Energy Federation)  
<Photo by Ryohei Kataoka, CNIC>

## Who's Who:

# Hajime Mikami

- Co-Representative, Mayors for a Nuclear Power Free Japan Network;
- Organiser, *Genjiren* Promotion of Zero Nuclear Power and Renewable Energy Federation;
- Free spirit

Hajime Mikami began to speak out about the dangers of nuclear power plants, not after 3/11/2011 but after 9/11/2001. The fourth passenger plane in the US terrorist attack, which crashed before it could reach its target, was headed for Three Mile Island, Mikami had no doubts about it, that's what he would do if he was a terrorist. Which means that nuclear power plants (NPPs) are basically nuclear weapons, aimed at their own people. Mikami, who was a management consultant at Funai Research Institute at the time, started to sound the alarm that the potential danger of NPPs far outweighs their usefulness.

On 12 March 2011, when the hydrogen explosion happened at Unit 1 of Fukushima Daiichi, Mikami was Mayor of Kosai City in Shizuoka Prefecture, his hometown. In just two weeks following the accident, opinion polls showed that those in favor of maintaining or promoting nuclear power plants and those in favor of restraining or stopping them altogether were split right down the middle and the two opposing sides were antagonizing each other. This shocked Mikami deeply. It was only a few years ago, but there was a general atmosphere which did not allow public officials to say anything anti-nuke. Still, Mikami couldn't be worried about that.

In his address to Kosai City municipal staff at the beginning of the new financial year in April, he made a no-nuke declaration and began to take action. In the course of his public duties he met lots of different people. When he gave his business card to Yuukoh Fujita and Hiroaki Koide (physicist/engineer, well-known in the anti-nuclear movement) they commented that this was the first time they had met a mayor. On the strength of his rarity value, his name was added to the list of plaintiffs in the class action lawsuit demanding an injunction on the Hamaoka NPP. Through this connection he became good friends with Tsuyoshi Yoshiwara, who was the director of Johnan Shinkin Bank at the time (at present, he is *Genjiren* Representative).

The 17 April 2011 Nagoya edition of the Asahi Shinbun reports that Mikami had already worked out a framework for a no nukes mayor's network.



Within that year he met with Tatsuya Murakami, Mayor of Tokai Village in Ibaraki Prefecture, who was demanding that the government decommission Tokai 2 NPP. He also met with Katsunobu Sakurai, Mayor of Minamisoma City in Fukushima Prefecture, who had refused to accept subsidies connected with nuclear power plants. He requested both of them to be the official initiators of the mayor's network and they readily agreed. Following that, after joining the Global Conference for a Nuclear Free World movement, the present Mayors for a Nuclear Power Free Japan Network was born.



People who have only seen photographs of Mikami may have the impression that he is a hardened anti-nuke warrior, but his speeches are as funny as a stand-up comic and the audience always seems to be having a lot of fun. In everyday life, Mikami is usually smiling. And just like his caricature stamp, his head, free of hair, shines. Shining brightly and smiling happily, appealing for a nuclear free world, Mikami is a truly unique key person in the world anti-nuke movement.

<YAMASHINA Atsushi, freelance writer>

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