



## Fukushima Daiichi NPS today - Five years since the disaster began



*Fukushima Daiichi NPS taken from Kawauchi Village, 15 km away. Reactors No. 1 through 4 can be seen from left to right (the building surrounding Reactor No. 3 was blown away when it exploded so is not visible). A large number of tanks holding contaminated water can also be seen.  
(Photo by Ryohei Kataoka (with cooperation from Ruiko Muto), 28 December 2015)*

### 1) After 5 years, still very little is known about the causes and effects of the Fukushima nuclear disaster

A whole five years will soon have passed since the severe accident occurred at the Fukushima Daiichi Nuclear Power Station (FDNPS). Nonetheless, the causes of the accident have not yet been clarified. Which was the main cause of the accident: the earthquake, or the tsunami? It is certain that both were implicated, while those who are promoting the restart of other long-idle nuclear power stations in Japan seem to believe that gigantic barriers, like those that can be seen near the Hamaoka NPS, owned by Chubu Electric Power, and the Kashiwazaki-Kariwa NPS, owned by Tokyo Electric Power Company, will be sufficient to protect them against the onslaught of an enormous tsunami. However, do we believe that barriers could be a fundamental solution?

For many of the breakdowns that occurred in FDNPS Units 1 to 4, it is still unknown how, for what reasons, and in what sequences they occurred,

including those of the nuclear reactors, containment vessels, and other nuclear facilities. Currently, many other nuclear power stations are under government investigation to assess whether or not they meet the new control standards. However, these investigations are not reliable because the causes and consequences of the breakdowns during the FDNPS accident have not yet been persuasively clarified.

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At the site of the crippled FDNPS, post-accident work is facing extreme difficulties and there is little prospect for a conclusion in sight. The truth is that the objective facts upon which a scientific and technical discussion must be based are unknown, thus making it impossible to formulate plans. The reason why objective facts are unavailable is that the site is too highly contaminated with radioactivity, making direct investigations of the interior of reactor buildings, damaged facilities, as well as the location of molten fuel and its condition unthinkable. The underground areas of the turbine buildings and nearby facilities are submerged under highly contaminated radioactive water and cannot be investigated.

In February 2015, about one year ago, an investigation team from the Niigata Prefecture Technical Committee on Nuclear Power Safety Management entered FDNPS for a short time to check the condition of damage on the fourth and fifth floors of Unit 1. One of the team members was exposed to a dose of about 8 mSv. As of January 10, the air dose rate near the main gate of FDNPS is as high as 0.748  $\mu$ Sv/h.

The major points of the FDNPS accident whose details remain unknown are listed below:

- There is a piece of evidence that suggests that the emergency AC power supply of Unit 1 was lost before the recorded tsunami arrival time. It is therefore natural to conclude that the isolation condenser pipes were damaged by the earthquake. It is highly likely that this pipe damage directly caused the meltdown in the Unit 1 reactor core.
- As for Units 2 and 3, the reactor core isolation cooling system (RCIC) stopped automatically, but the cause is unknown.
- The Unit 1 safety relief valve (SRV), which acts to release excessive reactor pressure, very probably failed to work. However, neither the facts nor the reasons associated with the failure are known.
- Fire engines were used to pour water over the reactors to cool them down. The water did not actually reach the reactors and flowed somewhere. The amount of water used and its whereabouts are unknown.
- At Units 1, 2 and 3, pressure release from the containment vessel through the vent could not be performed as scheduled. At Unit 2, it is not known whether pressure release through the vent was successful or not.
- The processes and causes of the hydrogen explosions in Units 1 and 3 are not known at all. They are suspected to have been associated with pressure releases through the containment vessel vent, but the details are unknown.
- Where the hydrogen explosions occurred is also unknown. Regarding the explosion in Unit 1, it is suspected that an initial explosion occurred on the fourth floor and a secondary explosion on the fifth floor, while TEPCO explains that the explosion occurred only on the fifth floor, without providing reasons. In the case of Unit 3, TEPCO has admitted that the explosion occurred both on the top floor and the floor below.

## 2) Admidst continuing damage, questions of health and safety remain unanswered

The M9.0 Great Eastern Japan Earthquake of March 11, 2011, and the subsequent tsunami, severely damaged the eastern part of the Japanese archipelago, especially the Tohoku region, including Iwate, Miyagi, and Fukushima Prefectures. The number of fatalities and missing persons resulting from the earthquake and tsunami are 4,673 and 1,124 in Iwate; 9,541 and 1,237 in Miyagi; and 1,613 and 198 in Fukushima (as of December 10, 2015). In addition, there are many who lost their lives “in association with the earthquake disaster.” Their numbers are 458 in Iwate, 918 in Miyagi, and 2,007 in Fukushima (for Iwate and Miyagi, as of the end of September 2015, and for Fukushima, as of December 28, 2015).

Among the three prefectures, Fukushima is far higher than the other two in the number of fatalities associated with the earthquake disaster. In Fukushima, the number is actually higher than the total number of those killed by the earthquake and tsunami. A significant number of people decided to take their own lives, having despaired of their future, because of radioactive contamination and air dose rates. This is a great tragedy. Some people lost hope for life, having been forced to evacuate from their hometowns, and have become mentally and physically exhausted by life in cramped temporary housing. It is only reasonable that those who are used to living in large houses are unable to endure life as evacuees, especially when that may look like continuing for the foreseeable future.

In Fukushima, whether evacuees, including those who left their hometowns voluntarily, can return or not, and whether they may choose to return or not is emerging as a serious social and political issue. The national government aims to withdraw the evacuation orders by March 2017, provided that the annual air dose rate is no greater than 20 mSv. However, the reference rate of 20 mSv/y is unspeakably high.

The unit *sievert*, or Sv is a measure of the biological effect of ionizing radiation, but it is a relatively ambiguous concept from the scientific point of view. A specific case clearly shows this ambiguity: In 1991, Nobuyuki Shimahashi, who was a healthy young man, died of chronic myelogenous leukemia at the age of 29. Later, in 1994, authorities acknowledged that his death had been associated with the work he had been engaged in. Mr. Shimahashi had worked at the Chubu Electric Power Hamaoka NPS, where he was exposed to a dose of 50.93 mSv over a period of 10 years. His exposure was about 5.1 mSv/y.

In a legally-specified radiation controlled area, workers who handle radiation and radioactive materials are required to behave carefully. Eating and drinking are prohibited and there is no washroom. Minors are not admitted. A zone is designated as a radiation controlled area when the dose rate exceeds 5.2 mSv/y. The reference

level specified by the International Commission on Radiological Protection (ICRP) for the general public is 1 mSv/y or lower. However, a statement issued by the ICRP on March 21, 2011, immediately after the Fukushima accident, says that “the reference level for the general public may be between 1 mSv/y and 20 mSv/y after such an emergency condition has returned to normal.” Nevertheless, if a person lives for five years under a dose rate of 20 mSv/y, the accumulative exposure may reach 100 mSv. The national government should ascertain scientifically whether exposure to such a large dose of radiation is carcinogenic or not. In consideration of these cases, the reference dose level used for the return of evacuees is too high. It is understandable that 808 people in 206 households of Minami Soma City, Fukushima Prefecture, filed a lawsuit with the Tokyo District Court against the national government (in 2015) protesting that the withdrawal of the evacuation order from the city is illegal.

### 3) Possibility of increase in incidence of thyroid cancer among children

Reports tell us that after the Chernobyl nuclear accident the number of thyroid cancer cases among children started to increase rapidly after four to five years had passed. Some are of the opinion that, because of the Fukushima accident, a rapid increase in the incidence of juvenile thyroid cancer may occur in the same manner. According to these opinions, the incidence of juvenile thyroid cancer will be far greater than the standard incidence, which is three in one million (ages 0 through 19), and such a high incidence could only be explained by the Fukushima nuclear accident.

Concerning the incidence of juvenile thyroid cancer, no exact comparison between before and

after the accident is possible, because pre-accident data of the same scale and method is not available. Experts with the national government explain that the incidence increase is a result of screening effects and overdiagnosis, and is not associated with the accident. However, statistical research suggests that the incidence of juvenile thyroid cancer has been on the increase. The truth will become clear in the near future.

### 4) No prospect for the construction of intermediate storage facilities for radioactive waste

The disposal of radioactive waste exceeding 8,000 Bq/kg resulting from the FDNPS accident has made no progress. The original plan was to build one disposal site in each of the five prefectures, Tochigi, Miyagi, Ibaraki, Gunma, and Chiba. Although five years has passed since the accident, no disposal site has yet been mapped out.

Throughout Fukushima Prefecture, there are heaps of contaminated radioactive rubble and refuse packed in flexible container bags. These are waste materials that are supposed to be stored at an intermediate storage site. Although the location of the site has been decided, most of the landowners of the planned premises have not been identified. When the intermediate storage site will be completed remains unknown.

This article has introduced some of the difficulties Japan is facing after the Fukushima nuclear accident. No nuclear power plant is free from the risk of an accident. Even Japan, which is known for its outstanding technological development, cannot find effective ways to deal with the aftermath of the nuclear accident.

(Yukio Yamaguchi, Co-director, CNIC))



*Radioactive waste: Waste generated from decontamination is contained in flexible container bags. Large piles of bags have accumulated throughout Fukushima Prefecture, these ones are in the Miyakoji District of Tamura City. The air dose rate was 0.262 $\mu$ Sv/h (Photo by Ryohei Kataoka, (with cooperation from Ruiko Muto) 28 December 2015)*

# Current State of Post-Accident Operations at Fukushima Daiichi Nuclear Power Station July to December 2015

## 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 and there is no guarantee of the accuracy of values being measured. However, from the water temperature in the containment vessels and the spent fuel pools, and from the state of releases of Xenon-135, which is released when uranium undergoes fission, and other measurements, it can be estimated that the state of the reactors is stable.

## State of Post-Accident Operations

### 1. State of Operations concerning Spent Fuel Pools

Removal of all of the fuel assemblies stored in the Unit 4 spent fuel pool (SFP) was completed on Dec. 22, 2014.

Measures are being implemented at Unit 3 to reduce the radiation dose level in preparation for the work of removing the fuel. Work for removal of large pieces of debris from the SFP was completed on November 21, 2015. Thus far, it has been confirmed that there are six deformed fuel assemblies.

The work to dismantle the cover in place around the Unit 1 reactor building began on May 15, and removal of the roof panels was completed on October 5.

Approaches for dismantling the upper section of Unit 2 reactor building were considered and it was decided to completely dismantle the section above the top floor of the building. Dismantling of buildings in the surrounding area began in September in preparation for removal of the fuel.

### 2. The Problem of Contaminated Water

According to an estimate by Tokyo Electric Power Company (TEPCO), roughly 800-1,000 m<sup>3</sup> of groundwater is flowing into FDNPS Unit 1 to 4 per day, about 300 m<sup>3</sup> of which is flowing into the reactor buildings.

TEPCO is implementing seven different kinds of measures to suppress the flow of groundwater:

1. Groundwater pumping wells have been installed on the mountain side of the site to pump up groundwater and release it into the ocean after measuring its contamination level. This "groundwater bypass" for reducing the inflow of groundwater began operation in April 2014. A total of 154,021 m<sup>3</sup> of water have been released (up to December 21, 2015). In October 2015, TEPCO estimated that, combined with the water suppression measures taken at the high-temperature incinerator building, this operation reduced the groundwater inflow by 80 m<sup>3</sup> per day.)
2. Installation of a sea side water barrier to prevent contaminated water leaking out with groundwater. The construction work was completed in October 2015, but due to a rise in the level of groundwater, which now had no outlet, the water barrier warped and a fissure appeared between the ground and the barrier. Repairs were completed on December 5.
3. Groundwater is being pumped up from the pumping wells, known as sub-drains, that have been dug around the buildings, and this being released into the ocean after processing at the water processing facility for water from the sub-drains and other locations. This measure began operation in September 2015. Around 360 m<sup>3</sup>/day of water are being pumped up and a total of 36,376 m<sup>3</sup> had been released as of December 21, 2015.
4. Groundwater is being pumped up from pumping wells known as groundwater drains, five of which were dug in the vicinity of the sea side water barrier, and is being released into the ocean after processing at the water processing facility for water from the sub-drains and other locations. This operation began in November 2015, when the groundwater level rose. Around 90 m<sup>3</sup>/day are pumped up for a total thus far of 14,380 m<sup>3</sup>. The groundwater level is being adjusted in combination with groundwater pumping (80 m<sup>3</sup>/day) using well points which began operation in August 2013.
5. Construction of an inland water barrier (creation of a frozen earth water barrier by burying 1,568 refrigeration pipes and 359 temperature measuring tubes at set intervals around Units 1 to 4.) The preparation for freezing was completed on the three inland sides on September 15 and the work to install the refrigeration pipes of the remaining sea side was completed on November 9. Trial freezing, which began on April 30 at 18 locations using 58 freezing tubes, showed differences in freezing temperature, but TEPCO has assessed the freezing trials as having no problems.
6. Implementation of removal of highly contaminated water flowing from the buildings into trenches on the sea side. Work on Unit 4 to stop water flows and to remove contaminated water, was conducted in two stages and

completed on April 28 and December 21, for Unit 2 on July 10, and for Unit 3 on August 27.

7. Operation of the Advanced Liquid Processing System (ALPS – three existing systems, three additional ALPS systems, and a high performance ALPS system) to separate contaminants, including nuclides, from contaminated water, although tritium still remains in the treated water, and to reduce the strontium content of concentrated salt water.

On August 11, the Fukushima Prefectural Federation of Fisheries Cooperative Associations approved the troubled plan to release treated water pumped up from the sub-drains and groundwater trenches into the ocean. Five conditions, including strict implementation of water quality management and a continuation of compensation, were agreed to as part of the approval.

TEPCO estimates that the operations 3. and 4. above that were begun on the basis of the approval have reduced the inflow of groundwater into the buildings by 200 m<sup>3</sup>/day. The plan to release treated groundwater that had up to now been allowed to flow into the ocean once the sea side water barrier had come into operation has had to be abandoned because the groundwater pumped up was found to be so highly contaminated that it could not be processed by the water processing facility for water from the sub-drains and other locations. As a result, the volume of water transferred to the building for treatment by ALPS is increasing (around 400 m<sup>3</sup>/day as of December 18). The total inflow to the reactor buildings increased to 600 tons per day.

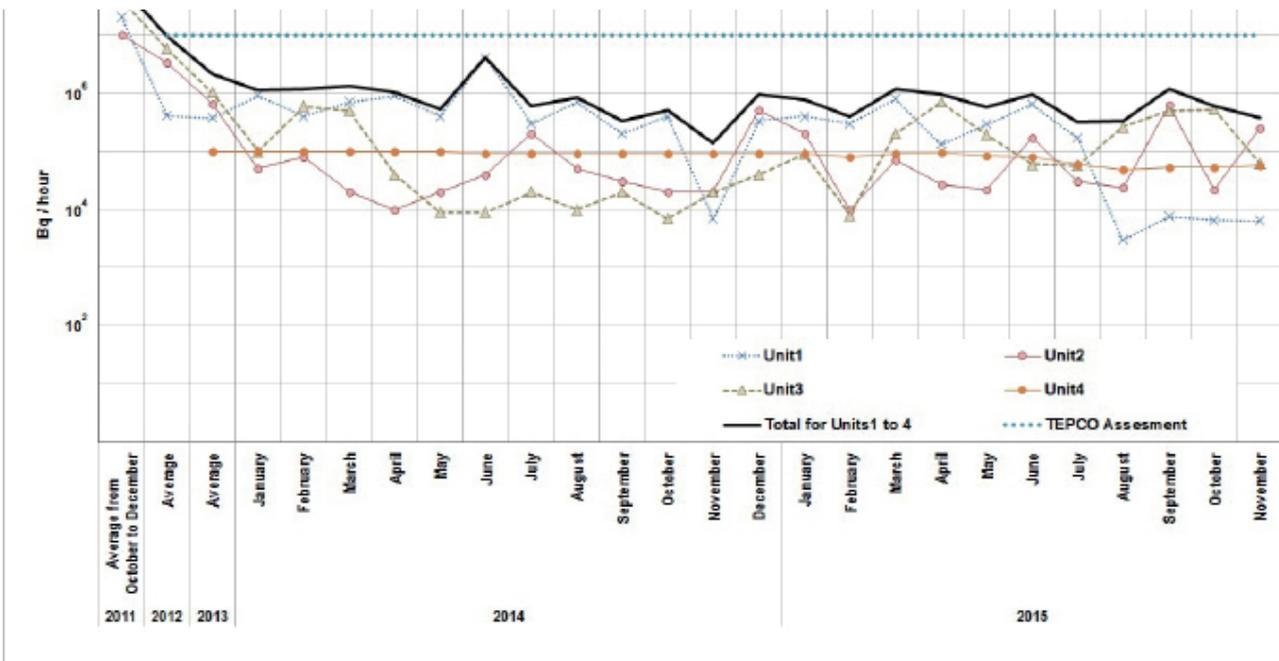
**3. Removal of Fuel Debris**

Work needed to reduce the radiation dose inside Unit 1 in order to inspect the inside of the reactor containment vessel is under way. Preparations are being made for an internal inspection of the containment vessel by robot, following on from similar attempts in April 2015. Robots are now being developed for an internal inspection of the containment vessel of Unit 2. In October, an inspection device was dispatched to the inner cavity of the reactor containment vessel of Unit 3 and it was confirmed that the internal dose level there was lower than in other units (around 1 Sv/h). Further, an inspection of the reactor containment vessel equipment hatch was carried out using a small device in November.

**4. Others**

The number of workers at FDNPS was around 2,950 daily as of March 2013, but in March 2015 this had increased to 7,450, and even in November this figure was 6,450. On August 8, a fatal accident occurred while a vacuum car was carrying out cleaning work. This was the third fatal industrial accident to have taken place during the post-accident work at FDNPS, the previous cases having occurred in March 2014 and January 2015.

(Hajime Matsukubo, CNIC)



**Figure 1:** Releases of radioactivity from Units 1 to 4 of Fukushima Daiichi Nuclear Power Station (Bq/h)  
 \*An assessment by TEPCO shows 10 million Bq/h up to May 2014 and less than 10 million Bq/h after May 2014

# Decommission Monju! 2015 Stop Takahama Units 3 & 4

## Report on National Public Meetings

The 'Decommission Monju 2015' National Public Meeting was held on 5 December 2015 in Fukui City. 750 participants from all over Japan demanded the decommissioning of the Monju fast breeder reactor (FBR). Three of us attended from CNIC.

Twenty years has passed since the accident, on 8 December 1995, involving a fire resulting from a sodium leak at the Monju reactor, situated in Tsuruga City, Fukui Prefecture. During these 20 years, Monju has hardly been operational, with another accident in August 2010, involving a fuel replacement crane falling into the nuclear reactor. Furthermore, it was disclosed in November 2012 that more than 10,000 maintenance checks had not been performed. Then, on 13 November 2015, the Nuclear Regulation Authority issued an advisory to the Ministry of Education, Culture, Sports, Science and Technology (MEXT) that Japan Atomic Energy Agency, the operator of Monju, should be replaced and a new operator found. The fast breeder reactor Monju, which had been considered the linchpin of the nuclear fuel cycle, is now facing a major turning point.

At the public meeting, a dialogue on 'Questioning the pros and cons of the nuclear fuel cycle' took place between Tatsujiro Suzuki (former Vice-Chairman of the Japan Atomic Energy Commission, Director of the Research Center for Nuclear Weapons Abolition, Nagasaki University, RECNA) and Hideyuki Ban (Co-Director of CNIC). At the end of the meeting, residents of Fukui Prefecture reported that they were planning to launch a court case against the national government demanding that Monju's construction permit be revoked (filed with the Tokyo District Court on 25 December 2015).

Following the Monju meeting, participants joined another rally, 'Stop Takahama Unit 3 & 4 Restarts!' in a neighboring park, expressing their opposition to the restarts and their support of a temporary injunction to stop the Ohi and Takahama reactors. After the rally, 1200 people marched through Fukui City chanting slogans such as 'Decommission Monju!' 'Stop the nuclear fuel cycle!' and 'No restarts!'

### Outline of the dialogue 'Questioning the pros and cons of the nuclear fuel cycle'

#### *What was your first impression on hearing the news of the Monju accident 20 years ago?*

**Suzuki:** I was in the USA at the time, where there had already been reports of accidents caused by sodium leaks in FBRs, so I thought, now Monju, too. Rather than any technical problem, I was more shocked by the cover-ups and organizational problems that were exposed. The Monju accident must have caused a strong sense of crisis within *Donen* (Power Reactor and Nuclear Fuel Development Corporation) and the Japanese Atomic Energy Commission at the time. Unfortunately that sense of crisis has faded over the last 20 years.

**Ban:** On December 9, when the first explosion was reported, we held a protest outside the *Donen* head office in Tokyo on that same day. The following year, governors from three prefectures, Fukui, Niigata and Fukushima, submitted

recommendations to the then Prime Minister, Ryutaro Hashimoto. These recommendations suggested that there was a lack of public consensus on nuclear policy and that the national government should take a leadership role in forging a public consensus on the use of plutonium. After this, little by little, information was released to the public. In connection with this, a dialogue event was held with the Science and Technology Agency and CNIC established the 'Monju comprehensive evaluation council', later producing a report on the Monju accident and Japan's plutonium policy.

#### *How do you view the Nuclear Regulation Authority Recommendations?*

**Suzuki:** They are very severe. Basically they are saying that the present organization is not fit to operate nuclear facilities. I think these are the most severe recommendations that could have been issued within the present purview. Trying to find a new operator will be quite difficult. Monju is a prototype reactor and a generating plant and



that is why electricity companies are cooperating. The power industry at first supported building a demonstration model which would eventually be developed into a commercially viable project. In this case, of course it would be best if the power industry's strengths were utilized in the operation of Monju. Surely it would not be possible for the power industry to say they couldn't do it. That's what I thought, but the other day, the Federation of Electric Power Companies of Japan said that they would not be able to take on Monju. Which makes you think that the power industry, right from the beginning, was not so interested in even the demonstration model. If this is the position of the power industry, I think it will be very difficult to find an organization which will be able to operate Monju as a generating plant.

If they are really intent on operating Monju, efforts must be made to bring together the people with operating experience as well as the power industry and, if necessary, overseas experts, to create a new organization to operate Monju. This will require a strong will and a lot of time.

**Ban:** In the Nuclear Power Sub-committee of the Ministry of Economy, Trade and Industry, which I participate in, the approach towards fast breeders is that the R&D plan issued by MEXT is simply quoted, but whether or not this research has any meaning is never discussed. For example, within the Ministry's plan, Monju is supposed to be used to reduce the toxicity of radioactive wastes. Research on whether or not it is actually reducing toxicity and to what level, has been carried out since the 1980s, but until now there is no prospect in sight for practical application of this research. I have suggested many times at the Sub-committee meetings that this should be properly evaluated, but I am ignored.

### *A chance to revise nuclear policy?*

**Suzuki:** It is very hard to make any reforms with the premise of Monju's survival. Up until now we have seen only conventional approval. But we should approve of something not just because it is national policy, but because it meets the needs of society. We should see this as a chance to launch a debate on the entire issue of fast breeder reactors and the nuclear fuel cycle. We need to set up a mechanism where the Diet or the Science Council of Japan etc. can debate and evaluate the issues independently of the government, breaking away from the rigidity of MEXT.

**Ban:** Over 20 years, Monju has hardly been operational at all, so the technology cannot be passed on as there is no one left with full knowledge of the reactor. Maintenance has been allocated to the company that installed the machines, but the original workers have now all been replaced. It's not just a matter of proper maintenance checks not being carried out, classifications of safety levels had not even been fixed. The present operators should be the ones with the most detailed knowledge of Monju, but as even they have been judged unfit to run it, it seems very unlikely that anyone else will be able to. Japan's science and technology projects run on a convoy system. Simply replacing the operator at the top will not improve anything. The only alternative for Monju is to close it down.

(Article & Photos: Ryohei Kataoka, CNIC)



*Participants demanding the decommissioning of Monju and no restarts of Takahama 3 & 4 -5th December 2015, Fukui City*

## How Should We View Last December's India-Japan Summit?

Prime Minister Abe visited India on December 12 last year, where he held a summit with Indian Prime Minister Modi at which they signed a memorandum on entering into a Nuclear Cooperation Agreement based on the assumption of nuclear exports to India. Problems with the India-Japan Nuclear Cooperation Agreement were brought up in NIT 164 and 169, but I would like to consider them anew in light of the significance of the recent summit and memorandum.

### India : Nuclear Weapon Possessing State

The most important point in considering a nuclear agreement with India is that India has entered into neither the Non-Proliferation Treaty (NPT) nor the Comprehensive Nuclear-Test-Ban Treaty (CTBT), but possesses nuclear weapons. While claiming it will abolish its nuclear weapons, India refuses to sign the NPT, calling it an unequal treaty; nor has it ratified the CTBT because of issues such as its recognition of subcritical experiments. On the other hand, India possesses nuclear weapons and has conducted nuclear testing twice, in 1974 and 1998. The plutonium used in the 1974 test, in particular, was produced using a nuclear reactor provided by Canada and America for peaceful purposes.

India's nuclear testing has come under criticism worldwide, and the country has become alienated from international atomic energy development, to the point that in 2008 India voluntarily ceased nuclear testing, promised no preemptive use of its nuclear weapons, and ratified the IAEA Additional Protocol, which allows observation by the International Atomic Energy Agency (IAEA) of nuclear facilities declared by India and the India-United States Civil Nuclear Agreement to be for civil use.

Currently India continues manufacturing plutonium, highly enriched uranium for their nuclear weapons program (aside from India, only Pakistan, North Korea and Israel continue producing these materials for military purposes), it is striving to modernize its nuclear weaponry, and shows no inclination to join either the NPT or the CTBT.

### The Significance of the India-Japan Nuclear Agreement

There are two major implications of Japan's concluding a nuclear cooperation agreement with India. The first is that it raises the level of acceptance of India as a nuclear weapon state, and the second is that it helps India proceed with nuclear development.

India possesses nuclear weapons, but it is not recognized as a nuclear weapon state under the international nuclear non-proliferation system. Since 2008, however, a number of countries,

including the U.S., France and Russia, have signed nuclear cooperation agreements with India while knowing that India possessed nuclear weapons. Furthermore, as a country that has been the victim of atomic bomb attacks and continues to appeal for nuclear disarmament and non-proliferation, Japan would be promoting acceptance of India's status as a nuclear weapon state if it entered into a nuclear cooperation agreement with that country while it continues to expand its nuclear arsenal.

Since 2008, France's Areva and America's GE Hitachi and Westinghouse have drawn up plans to construct six nuclear reactors each in India, and Russia's Rosatom, an additional eight. Currently, though, with the exception of Russia's, construction of the imported reactors is not proceeding. There are two reasons for this. First, India's nuclear energy damage liability law has certain peculiarities. Typical nuclear energy damage liability laws focus liability on the nuclear power companies, whereas India's enables the nuclear power companies to seek compensation for damages from the nuclear plant manufacturers. Because of the risk of liability, nuclear plant manufacturers are having second thoughts about going ahead with construction in India. Second, if Japan does not conclude a nuclear cooperation agreement with India, it would constitute a reason for the country not to import Japan's nuclear power equipment. It is said, for example, that India would like to obtain Japanese-made reactor pressure vessels because of their high reliability. These two factors are intertwined and explain



*Protests against the India-Japan Nuclear Cooperation Agreement were held around the world on December 12 2015. A man in an Abe/Hitler mask was at this one outside the PM's official residence in Tokyo*

why construction of imported reactors has hardly proceeded at all in India.

Note that India has long-term plans to extract plutonium from spent fuel and use it in fast breeder reactors, so it is requesting that Japan recognize that India will carry out reprocessing of spent fuel retrieved from Japanese-made nuclear reactor equipment, and it appears that Japan will comply. If Japan does comply, it will be the first time for Japan to allow reprocessing of spent fuel by the country it is exporting nuclear equipment to.

### Appraising the India-Japan Summit

In light of this, how should we view the India-Japan summit of last December?

In a joint statement, the leaders of India and Japan said the two countries share the hope that nuclear weapons will ultimately be abolished, and they are seeking an early conclusion to negotiations on a treaty banning the production of fissionable materials for nuclear weapons. They also pointed out the importance of expediting the effectuation of the CTBT (requiring India to join it soon, as a country whose participation is needed for it to go into effect). On the other hand, the two leaders confirmed that once the technical details had been worked out, they would conclude the nuclear cooperation agreement. They also confirmed that India would cooperate to become a member of international export control groups such as the Nuclear Suppliers Group.

In a speech on December 14, Prime Minister Abe talked about the India-Japan Nuclear Cooperation Agreement, saying that if India conducts nuclear testing, ceasing cooperation and placing India outside the nuclear non-proliferation system would "not really be effective towards the total abolition of nuclear weapons and such," stressing the significance of cooperation. Regarding this measure to cease cooperating, Kyodo News reported on December 17 that if India were to conduct nuclear testing, explicit procedures would be taken to halt immediately the reprocessing of spent fuel from the nuclear reactors exported by Japan.

At a press conference on December 14, however,

Indian Foreign Secretary Jaishankar gave a different impression from the meeting with Prime Minister Abe, replying, for example, "I do not think the NPT itself is a particular obstacle to this negotiation" and "It has been a longstanding position of India that reprocessing is an integral part of our nuclear programme...any solution...will be in consonance with our longstanding policy." Regarding the provision for cessation of cooperation in the event of nuclear testing, he commented: "Most countries in the world accept that India's word is credible, that Indian commitments (to voluntary discontinuation of nuclear testing) are serious." The impression these statements give is backed up by a report appearing December 14 in India's leading newspaper, *The Hindu*, of comments by Press Secretary Yasuhisa Kawamura that Japan was "not insisting on any nullification clause" in recent negotiations.

The logic of concluding a nuclear cooperation agreement in order to include India in the nuclear non-proliferation system is exactly the same as that of America in 2008 when it prevailed on other countries' governments to accept the IAEA Additional Protocol for India. However, even since 2008 when it was supposed to have become part of the nuclear-non-proliferation system, India has zealously expanded its nuclear armament. The NPT system, on the other hand, has become progressively weaker in recent years.

At a time when the nuclear non-proliferation system is growing weaker, recognizing exceptions greatly increases the distance to the goal of abolishing nuclear weapons. The government is worried about the effect the India-Japan Nuclear Cooperation Agreement might have on the House of Councilors election this summer, so it has declared a firm course of submitting it to the current Diet. Regardless of when it is submitted, though, the problems with this pact remain unresolved. By no means should a nuclear cooperation agreement be entered into with India. Signatures are currently being sought for an international appeal opposing the India-Japan Nuclear Cooperation Agreement. We ask for your kind cooperation.

### International Appeal:

<https://goo.gl/SYBuIk> (in English)

<https://goo.gl/bW7SKz> (in Japanese)

(Hajime Matsukubo, CNIC)

*Protests in Jaitapur, India, where over 1,000 citizens, including many women, deliberately got themselves arrested as part of a civil disobedience action called 'Jail Bharo' to protest the Nuclear Agreement and PM Abe's visit to their country on December 12 2015*



## Group Introduction

# Tokai Anti-nuke Action Study Group

Kazumasa Aizawa\*

On March 11, 1997, Power Reactor and Nuclear Fuel Development Corporation (PNC; now Japan Atomic Energy Agency), located in Tokai Village, Ibaraki Prefecture, which is 100 kilometers north of Tokyo on the Pacific coast, suffered a fire and explosion. It was a serious nuclear accident in which 37 subcontractor employees were exposed to radiation. The establishment of the Tokai Anti-nuke Action Study Group was one response to this incident. The proposal statement of the establishment of the group was concluded as follows: “We hereby propose the establishment of this small group to review the current conditions of Tokai Village, in the area of village planning that could be independent of the nuclear power plants and reprocessing plant, having learned of the horror of accidents at nuclear facilities from the recent PNC explosion and exposure accident, and having noticed that the current “prosperity” of the village, surrounded by these dangerous facilities, is a mere falsehood which would collapse immediately if a major accident were to occur.”

The group’s first meeting took place on May 11 of the same year, and we began by meeting once a month thereafter. Initially our activities were mainly discussions and study sessions. The membership was about ten persons.

On September 30, 1999, JCO, a Tokai-based company engaged in nuclear fuel conversion, experienced a criticality accident. Three workers were exposed to severe radiation, two of them fatally, and more than 600 people in the village were exposed. At the time, it was the most serious accident ever to take place in the history of Japan’s nuclear development. The critical state lasted for 20 hours, causing extreme anxiety for people in the village and surrounding areas. They began to doubt the nuclear safety myth that “nuclear accidents would never occur,” which was commonly heard at the time. We believed that the nuclear era had been brought to a halt by this accident and that social trends were shifting toward denuclearization, and we therefore shifted our activities from learning-focused ones to more specific direct actions.

After the accident, we formed the JCO victims’ group, together with those living near the JCO plant, who suffered damage and health hazards, and helped them to file suit against the company. A member of the Tokai Anti-nuke Action Study Group successfully ran for a seat on the village assembly. After this election victory, the group started to issue a periodical newsletter named *Hamabōfū* (the name of a local flower). The quarterly enabled the group to communicate regularly with people both inside and outside the village.

In 2000, Ibaraki Prefecture started a health checkup program for people living near JCO. We hold a critical stance toward this program because



the official purpose of the program is to relieve people’s anxiety, not to monitor the effects of radioactive exposure. Nevertheless, we started to survey the people undergoing the checkup by conducting a questionnaire at the venue to learn the opinions of the locals about the program and send the results to the Ibaraki Prefectural office.

On March 11, 2011, the Great Eastern Japan Earthquake occurred, followed by the Fukushima Daiichi Nuclear Station accident. One of the initial actions the Tokai Anti-nuke Action Study Group took after the accident was a campaign to collect people’s signatures against the restart and for the decommissioning of, the Tokai Daini Nuclear Power Station, which the village hosts. We were also committed to having similar petitions submitted to all local assemblies in Ibaraki Prefecture. Other actions organized by our group included rallies, in which people from municipalities both inside and outside Ibaraki Prefecture participated. As a result of these actions, 23 out of a total of 44 municipalities in Ibaraki Prefecture adopted the petition in their assemblies.

In 2013, based on the understanding that making the reality of Fukushima widely known is important for the promotion of denuclearization, we organized lecture and discussion gatherings, photograph exhibitions and various kinds of talks. In cooperation with other groups, we have been organizing the “Do Not Forget March 11! Eleventh Action Tokai” at the east gate of the JR East Tokai Station on the 11th of every month.

Currently, the Tokai Anti-nuke Action Study Group is administered by five representatives and has 50 subscribers to *Hamabōfū*. The quarterly is also delivered to 3,000 households in the village. In January 2016, the group member who had long been a village assembly member retired, and a successor is running for the assembly to take over the seat.

\*Representative of Tokai Anti-Nuke Action Study Group

# NEWS WATCH

## Earthquake-related Deaths Top 2,000 in Fukushima Prefecture

Fukushima Prefecture announced on December 25, 2015 that the number of certified “related fatalities” occurring within the prefecture as a result of the Great East Japan Earthquake and Fukushima Daiichi nuclear accident in March 2011 had passed 2,000. The number increased by 185 during the past year. Along with health impacts of stress among the refugees arising from the loss of their homes and living long-term in temporary housing, the number of suicides has also increased.

As time passes, it becomes more difficult to determine a cause and effect relationship between evacuee status and fatal outcomes, and there are many cases that have not been certified.

## Volume of Contaminated Water Doubles

TEPCO disclosed on December 18, 2015 that the amount of contaminated water at the Fukushima Daiichi NPS had doubled. The sea side water barrier was completed on October 26 to prevent contaminated underground water from flowing into the ocean. However, the underground water flowing through the contaminated area behind the barrier and entering the underground water drains, from which it is pumped up, had a higher than expected concentration of tritium. The cause is said to have been an increase in the amount of water conveyed through the reactor buildings. That had been estimated at about 50 tons per day, but has risen to about 400 tons per day.

While the amount of underground water flowing into the plant has decreased from about 300 to 200 tons per day after operations were started in September to remove water from the sub-drains of the wells around the reactor buildings, exclude some of the radioactive contaminants and discharge it into the sea, the amount flowing through the reactor buildings has doubled to about 600 tons per day.

The possibility of changes in underground water flow due to the pumping up from the sub-drains has been indicated as a cause of the water level rise in the underground water drains.

## Whither Monju?

Japan’s Nuclear Regulation Authority (NRA) gave an extraordinary advisory to the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the supervisory authority for the Monju prototype fast breeder reactor, on November 13, 2015 regarding the facility, which is owned by the Japan Atomic Energy Agency (JAEA). The NRA said that the JAEA lacked the ability to operate the plant and requested that a new operator be found within six months or, if that was not possible, that the ministry “fundamentally review” the reactor’s status. Operations first commenced at Monju in August 1995, but were halted in December of that year due to a major sodium leak and fire. They resumed briefly in May 2010 only to be halted again in August when an accident occurred in which a 3.3 ton fuel replacement crane fell into the reactor vessel. During that time, safety regulation violations were noted repeatedly during safety inspections, calling into question the competence of maintenance management. JAEA has received “multiple” safety measure orders, but there has been no improvement whatsoever.

Upon receiving the advisory, MEXT organized meetings of experts to consider the issue, with the first one held on December 28. MEXT is making the continued existence of Monju its top priority, attempting to force through a resolution not in line with the intentions of the NRA.

Citizens seeking Monju’s decommissioning filed a suit against the NRA in the Tokyo District Court on December 25 seeking to have Monju’s reactor installment permit revoked. For legal reasons, the NRA had to be designated as the defendant, despite the favorable intention behind its advisory.

## Takahama Units 3 and 4 Headed for Restart

The temporary injunction by the Fukui District Court on April 14, 2015 suspending operations, preventing Takahama Units 3 and 4 (both PWR, 870 MW) from restarting, was overturned on December 24 by a different judge in the Fukui District Court in a decision that recognized all of KEPCO’s objections.

KEPCO wasted no time loading fuel rods, starting the next day, December 25 and continuing to the 28th in preparation for restarting the reactors. Of the 157 fuel assemblies, 24 contain MOX fuel. The governor of Fukui Prefecture told the Minister of Economy, Trade and Industry on December 23, the day before the court decision, that he would recognize the restarts. The actions of KEPCO and the governor suggest they knew the details of the decision beforehand.

### **Application for Plan on Measures to Decommission Genkai Unit 1**

The Kyushu Electric Power Company completed its plans for measures to decommission the Genkai Unit 1 reactor (PWR, 559MW) on December 22, 2015 and applied to the NRA for approval. Under the plan, work would begin in FY2016, with dismantling and removal of the buildings and equipment to be completed by FY2043. The total cost is expected to come to about 36.4 billion yen.

### **Hamaoka NPS Tsunami Wall Completed**

A gigantic wall 22 m high and 1.6 km in total length to guard against tsunamis was completed on December 26, 2015 on the sea side of the Hamaoka NPS (two BWRs and one ABWR with a total output of 3,617 MW). Chubu Electric Power Company began constructing the wall in November 2011 as a countermeasure to tsunamis after the Great East Japan Earthquake and Fukushima Daiichi nuclear accident in March of that year.

The Hamaoka NPS is located in the hypothetical focal area of a megathrust earthquake predicted for the Nankai Trough, so this wall can in no way be called a sufficient safety countermeasure. The allocation of about 150 billion yen in total construction costs is raising suspicions that the company will try to restart the reactors.

### **Prospective Areas for High-level Radioactive Waste Disposal Sites to be Proposed in 2016**

The government held a ministerial meeting on final disposal on December 18, 2015, where it decided to aim for designation of “scientifically-based prospective areas” by the end of 2016 for the siting of final disposal facilities for high-level radioactive waste. The scientific criteria for prospective areas were established on December 11 by specialists’ working group serving as an advisory body to the Minister of Economy, Trade and Industry. Currently another working group is establishing social conditions such as restrictions on land use, and when those are ready, the plan calls for drawing up a three-colored map covering all of Japan and dividing it into areas of high suitability, moderate suitability and low suitability.

Prospective areas will be narrowed down in accordance with the colored map, and the government will make proposals for surveys to local governmental bodies. These surveys are to begin with a review of literature over a two-year period and a 1.0 billion yen subsidy. This is not so much an investigative period, but more an effort to gain local consent.

### **331 kg of Plutonium to be Sent to the Savannah River Site**

Based on the March 24, 2014 Joint Statement by the Leaders of Japan and the United States on Contributions to Global Minimization of Nuclear Material, Japan is scheduled to ship plutonium to America in March this year. Most of the 331 kg of plutonium is accounted for by nuclear weapons grade plutonium, which was being used in the JAEA’s fast critical assembly (FCA). The plutonium will be sent to the Savannah River Site facility.

The transfer has been scheduled to coincide with the 4th Nuclear Security Summit in Washington in March, seemingly to extol the success of the 3rd summit in 2014.

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Please write to us at [cnic@nifty.com](mailto:cnic@nifty.com) if you would like to receive email notices when new editions are published.

Editor: Caitlin Stronell

Translators: Tony Boys, Sumie Mizuno, Mayumi Nishioka, Pat Ormsby

Proofreaders: Tony Boys, Yukio Yamaguchi, Hajime Matsukubo