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Citizens' Nuclear Information Center

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Six Years after the Accident, Fukushima Increasingly Abandoned

On the 11th of March, a full six years passed since the nightmarish Fukushima accident occurred. Has the accident been explained? Has the number of victims stopped increasing? Has the future outlook for people's livelihoods become clear? Will there never again be another nuclear accident? Unfortunately, the answer to all the above is "no." The declaration of a nuclear power plant emergency issued at 7:03 p.m. on March 11, 2011, has not even been rescinded yet.

The sequence of events that led to the explosion of the Unit 1 reactor on March 12 is still not clear. How much hydrogen leaked, and by what path? Where did the explosion originate? Only Niigata Prefecture is continuing verification work by a technical committee open to the public. Even in the discussion on February 9 this year, TEPCO's assertions had inconsistencies, and the company failed to answer questions from committee members, saying it would go forward with new investigations.

The Unit 2 reactor also underwent a meltdown, but from the outside it appears as if nothing happened. Nearly six years after the accident, TEPCO deployed a robot with a camera into the containment vessel on February 9. It measured high levels of radiation exceeding 600 Sv/hr. TEPCO played its ace on February 16, sending in its "scorpion" survey robot, but the robot encountered sediment blocking its path before it could reach the pressure vessel, managing to advance a mere two meters (see News Watch pp. 10-11) for more details). Within the containment vessel, the level of radiation varies widely from 20 to 650 Sv/hr depending on location--if the measurements can be trusted for accuracy--but this indicates that debris containing various components has been scattered erratically. Plans for decommissioning the reactor will probably be greatly delayed.

Researchers are proceeding with studies on the composition of spherical particles containing cesium (cesium balls) originating from the accident. These particles were found in aerosols that reached Tsukuba, 170 kilometers away from the Fukushima Daiichi NPP. They are also being found in soil and waterways near the NPP. Within these vitrified particles measured in microns,

they have found iron, zinc, chromium, rubidium, molybdenum, uranium and other elements. If the genesis of these balls can be elucidated, it might throw light on the causes of the accident and the processes involved. These cesium balls have exceedingly high radioactivity, of the order of 10^{11} becquerels per gram, and are a cause of concern regarding environmental contamination.

In the six years since the accident, how far have radiation levels decreased? Cesium-134 has a half-life of about two years, so 1/23 of it would be left, or about 13%. On the other hand, Cs-137 has a half-life of about 30 years, so about 87% of it remains. According to the Ministry of the Environment, 57 municipalities of seven Tohoku and Kanto prefectures will have completed their decontamination as of the end of March. If so, where did the 87% go? Radioactivity does not just disappear instantaneously through decontamination with no passage of time.

The entire town of Tomioka in Fukushima Prefecture became an evacuation zone after the nuclear accident. In response to a government proposal to rescind the evacuation orders for all areas aside from the "areas to where it is expected that residents will face difficulties in returning for a long time" on April 1 this year, a mere 16% of the affected households responded that they would like to return. The return rates to the five municipalities for which the orders were rescinded as of July last year are 11% for Naraha, 14% for Minamisoma, 9% for Katsurao, and 21% for Kawauchi, with only Tamura having a return rate as high as 72%. That is because only a small part of Tamura had been evacuated to begin with.

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People who voluntarily evacuated from areas outside the evacuation zone are scattered throughout Japan. Fukushima Prefecture intends to cut off access this March to the free housing it had been offering to the 15,000 voluntarily evacuated households that had fled outside the prefecture as of December 2012. This is despite the lack of a rational basis for cutting them off. The standard of 20 mSv/year is nothing more than a criterion for times of emergency when there is nothing else that can be done.

Current State of Post-Accident Operations at Fukushima Daiichi Nuclear Power Station (August to December 2016)

State of the Plant

From the water temperature in the containment vessels and the spent fuel pools (SPFs), 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. Moreover, according to a TEPCO assessment, around 40,000 becquerels per hour (Bq/h) of radioactive materials were being released in December (see Figure 1). This is a considerable improvement when it is recalled that this figure was 560,000 Bq/h in December 2015.

The situation regarding the removal of spent fuel

Except for Unit 4, from which fuel removal has been completed, the SPFs of all other units are now being prepared for fuel removal. The important advance has been the completion on November 11 of removal work for the cover side panels on the Unit 1 reactor building. The installation of a shield on the operating floor of Unit 3 was also completed on December 2. The reduction of the dose rate on the operating floor of Unit 3 had not proceeded as expected, and the removal of spent fuel has been postponed to around the middle of FY2018 from the original FY2015.

State of the Frozen Earth Barrier (On-land water barrier) (see Figure 2)

As one part of the contaminated water countermeasures, the government and TEPCO have installed a frozen earth barrier (on-land water barrier, total length 1,500m) which encloses Units 1 to 4 at Fukushima Daiichi Nuclear Power Station (FDNPS). Freezing has been implemented in three stages. The first stage consisted of two phases, phase 1 (begun on March 31), in which freezing work was carried out for the whole of the sea side (690m), a part of the northern section of the mountain side (130m) and 77 priority freezing locations

At a citizen-exchange symposium on Priorities for a Global Sustainability Research Strategy, held by the Research Institute for Humanity and Nature on February 4 in Kyoto, the topic "What can we learn from the Fukushima nuclear accident experience and what should we communicate?" was rated the number one topic deserving research.

(Yukio Yamaguchi, CNIC Co-Director)

(290m), and phase 2 (begun on June 6), in which freezing work was carried out for the whole barrier (sea side, roughly 690m; mountain side, roughly 860m) except for seven locations on the mountain side (45m). As a result, temperature measurements using the side temperature tubes (installed at 5m intervals, roughly 85cm from the barrier) showed that 100% of locations on the sea side and 95% or more of locations on the mountain side had reached temperatures of 0°C or lower in late October. In the second stage, begun on December 3, freezing work is being carried out in two locations of those not yet frozen on the mountain side. The third stage will be the full freezing of the mountain side barrier.

According to TEPCO, as of December 2016, groundwater influx to the mountain side surroundings of the frozen earth barrier was 680m³/day, the amount pumped up from the subdrains around the buildings was 510m³/day, water actually flowing into the buildings was 140m³/day, and water pumped up from the sea side 4m base (the ground level at the sea side of the NPS buildings) was 170 m³/day. Further, of the water pumped up from the 4m base, a part of the most contaminated water was fed into the turbine building. The amount pumped up from the 4m base fell slightly below 192 m³/day, the lowest figure before the freezing of the frozen earth barrier.

TEPCO says that the reason for the reduction was a complex combination of effects, such as measures to prevent infiltration of rainwater, operation of the subdrains, full-scale freezing of the sea side frozen earth barrier, and so on. Originally, TEPCO had aimed at a pumped volume of 70m³/day, but the among the reasons given for the volume not falling that far were 1) the possibility that the flow of groundwater to the 4m base, which is linked with the alternately-layered non-frozen location in the lower part of the sea water pipe

trench, was greater than expected, 2) impacts of the structures that pass through the frozen earth barrier, and 3) the possibility that the permeability of the sea side water barrier was lower than expected.

The Nuclear Regulation Authority (NRA) had originally feared that if, when the frozen earth barrier was operated, the groundwater level fell below the water level of the contaminated water in the buildings, contaminated water would leak out into the groundwater. Toyoshi Fuketa, acting NRA chairman, stated at the 49th meeting of the Specific Nuclear Facility Supervision and Assessment Review Committee, however, that “Since the water barrier is letting this much water through on the sea side, it must certainly

be letting water through on the mountain side as well,” thus acknowledging that he sees that the effectiveness of the frozen water barrier is limited.

State of Onsite Water Tanks

As of December 2016, 1,001 tanks were storing contaminated water onsite. Of these, there still remain 219 flange-type tanks, which have experienced problems with leakage of contaminated water. TEPCO has said that the target for dismantling all flange-type tanks is March 2019.

(Hajime Matsukubo)

Figure 1: Releases of radioactivity from Units 1 to 4 of Fukushima Daiichi Nuclear Power Station (Ministry of Economy, Trade and Industry website)

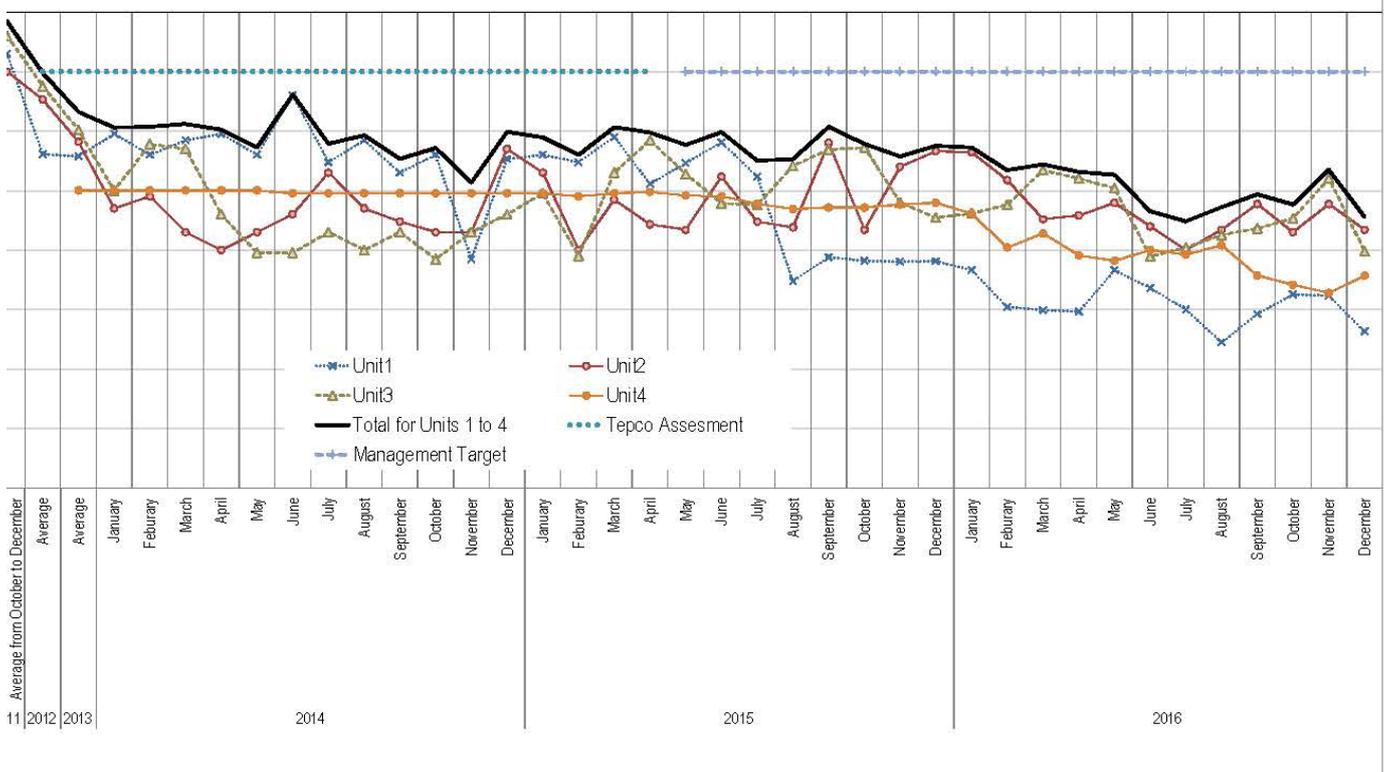
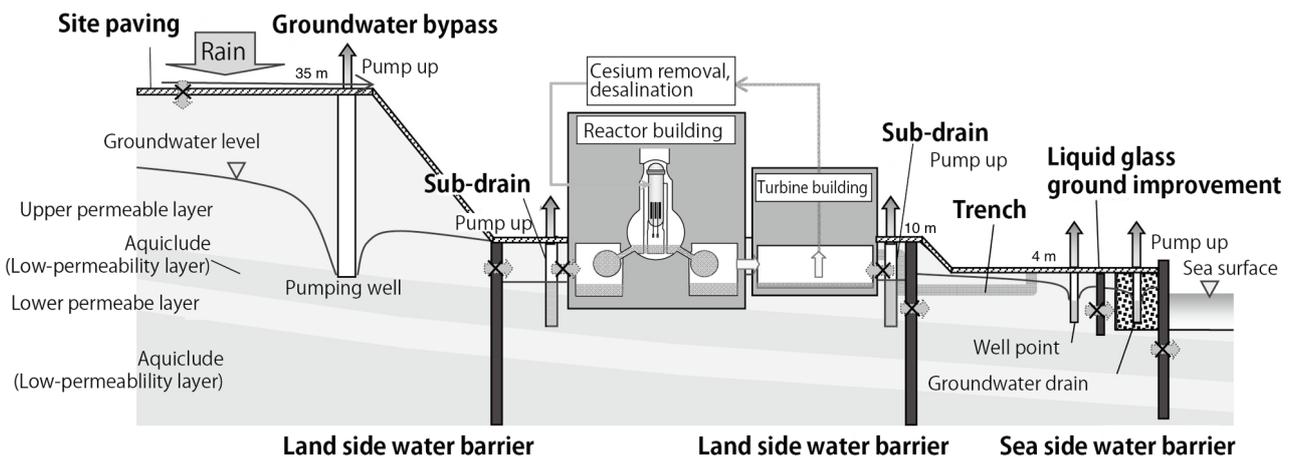


Figure 2: Groundwater measures at FDNPS (TEPCO website, with additions)



List of Accidents at Fukushima Daiichi Nuclear Power Plant, August to December 2016 (Excerpts from "NUCIA", Nuclear Facility Information Disclosure Library - http://www.nucia.jp/)		
Date (2016)	Location	Summary of accident (Bq: becquerels, L: liters)
Aug 10	Miscellaneous Solid Waste Incineration Facility	Fissures and pinholes were recognized on the expansion joint when checking problem locations after stopping systems A and B of the Miscellaneous Solid Waste Incineration Facility
Sep 1	Tank area H2	Flames and smoke were discovered coming from storm protection rubber sheet on the tank rotary painting ladder in tank area H2
Sep 8	Onsite	A worker from a cooperating company suffered a wounded finger in the materials warehouse close to the onsite anti-seismic building.
Sep 14	Unit 1 & 2 service building	Burn marks were recognized on the onsite broadcast speaker cable on the third-floor veranda of the Unit 1 & 2 service building.
Oct 6	Tank area E	Water was leaking from the top of the (flange-type) D5 tank in tank area E.
Oct 15	ALPS building	A water puddle was recognized in system A of the currently-suspended ALPS (Advanced Liquid Processing System).
Oct 17	Original ALPS building	Water puddles were recognized in two locations around the absorption tower in the A system of ALPS.
Nov 1	Onsite desalinization facility	Leakage from the area around the desalinization facility. Leaked amount was around 3 tons. No outflow to the external environment.
Nov 15	Subdrain, etc. water purification facility building	A water puddle (1L) was discovered below the inlet pipe of absorption tower 1B of the subdrain water purification facility in the subdrain, etc. water purification facility building.
Dec 4	Units 1 to 3 Common Spent Fuel Pool	The low suction pressure alarm sounded on the Units 1 to 3 Common Spent Fuel Pool secondary cooling system circulation pump (A). The system was switched to pump (B), but as the low suction pressure alarm sounded again, pump (B) was also stopped.
Dec 5	Unit 3	As the Unit 3 condensate storage tank water injection pump (B) stopped, water injection pump (A) was started.
Dec 6	Subdrain, purification building	Water was dripping from the inlet pipe to subdrain absorption tower No.5. Leaked amount was around 20L.
Dec 14	Unit 4 turbine building	When switching to from system A to system B of the desalinization device in Unit 4 turbine building, a leak was discovered coming from the system B outlet line.
Dec 15	Nitrogen gas separation device	Oil was discovered leaking from nitrogen gas separation device (A). The leaking oil was lubricating oil and it had accumulated in the trailer in which the nitrogen gas separation device was installed.
Dec 17	High-performance ALPS building	A water puddle (around 10cm by 20cm) was discovered below the outlet pipe of the H-P ALPS water treatment tank in the H-P ALPS building.
Dec 29	Nearby tank area H8	A water puddle was discovered in the pump room of the RO concentrated water transfer pump nearby the H8 tank area.
Dec 29	Nearby tank area H8	Evidence of dripping was discovered below the drain valve of the RO (reverse osmosis) concentrated water transfer pump outlet pipe nearby the tank area H8. The amount of water that had dripped onto the floor was about 0.4L.

PuPo 2017 Report

International Discussion of Japan's Plutonium Policy ~Towards change for the future

On February 23-24 CNIC, together with the Union of Concerned Scientists, held an international conference at the United Nations University in Tokyo. The theme of the conference was 'the US-Japan Nuclear Cooperation Agreement and Japan's Plutonium Policy.' This Agreement, which allows Japan to reprocess its spent fuel from nuclear power reactors and extract plutonium, reaches its 30 year period of validity in July 2018 and the PuPo (plutonium policy) conference is the first step in a campaign, using the opportunity of the expiring Agreement, to raise awareness of the serious problems Japan's plutonium policy is causing locally, regionally and globally, and to demand a rethink of the entire nuclear fuel cycle.

The two-day conference was well attended by citizens from all over Japan, members of parliament, the US Embassy and the Japanese media. The speakers included scientific, technical and policy experts, bureaucrats, diplomats and grassroots activists from Japan, Taiwan, China, South Korea, United States, France and Germany. Issues of non-proliferation, energy security, nuclear waste disposal and economic issues, as well as more concrete strategies on future actions, were discussed and summarized in the PuPo 2017 Statement (see pages 7-8) which was released at the end of the conference.

A meeting of divergent minds

The conference certainly brought together a large number of perspectives and opinions. It is not often that you find people with such diverse opinions on Japan's plutonium policy sitting at the same table and this was a unique opportunity to review the reasons why the Japanese government embarked on the nuclear fuel cycle policy and why the US-Japan Agreement was thus negotiated, as well as to how the situation has changed in more recent times. For example, in Session 2 of the conference, we heard from Mr. Matsui of Japan's Ministry of Foreign Affairs (MoFA), Disarmament Non-Proliferation and Science Department, who explained that Japan was pursuing the nuclear fuel policy in order to make effective use of resources and to reduce the volume and toxicity of nuclear waste.

In fact, the Ministry in charge of this policy is the Ministry of Economics, Trade and Industry (METI), which refused to attend PuPo despite long negotiations and its stated responsibility to explain why it is using such massive sums of taxpayers' money on the nuclear fuel cycle. Mr. Matsui obviously focused on the proliferation issues raised by Japan's plutonium policy, claiming that 'Japan's unique efforts to reduce proliferation risks' are 'the basis on which we were granted the right to reprocess.' He cited Japan's policy of disclosing its plutonium stockpile levels and Japan's commitment not to hold surplus plutonium. Mr. Matsui further stated that 'In my understanding, the US has never voiced concerns about the management of our plutonium in Japan.'

This point was one we had hoped to bring out in the conference and was in fact addressed by Prof. Tatsujiro Suzuki in his keynote address when he suggested that Japanese diplomats simply weren't talking to the right people in Washington, focusing on the Japan experts there rather than the disarmament/non-proliferation experts. Prof. Suzuki argued that this communication gap was the reason why Japan was 'not hearing' the concerns being expressed. He cited Daniel Poneman, John Holdren and Thomas Countryman as three prominent officials who had expressed deep concern about Japan's plutonium policy. Later in Session 2, Dr. Steve Fetter, who has had a long career in various policy positions in the White House, stated that 'the US would prefer that Japan got out of the Plutonium business altogether and that was expressed in the Obama administration, although perhaps not clearly enough...'

The second speaker in Session 2 was Ambassador Tetsuya Endo, a retired MoFA official who led the negotiations in the 1980s which resulted in the present US-Japan Nuclear Agreement. Mr. Endo tried to justify Japanese reprocessing through traditional arguments of possible uranium shortages in the future, as well as reducing waste storage space in land-limited Japan and energy security for resource-starved Japan. While these arguments may have had some relevance in the 1980s, many speakers pointed out the massive differences in projections and changes in reality in the

21st century. Even Mr. Endo agreed that Japan needed to have a clearer future vision for its reprocessing policy, possibly a 'control tower' led comprehensively by the government, reducing the role of private enterprise.

Also on this panel was Mr. Nobuyasu Abe, who is a present member of the Atomic Energy Commission (AEC), although he was speaking in a personal capacity not as a representative of the AEC. While not dismissing Japan's reprocessing policy entirely, especially for research purposes, he did suggest that Japan should face the reality of the large plutonium stockpile and the very limited number of pluthermal reactors that are operational, and should be in no hurry to start up the Rokkasho Reprocessing Plant. He also suggested that Japan ask the UK and France to keep its overseas stockpiles in those countries and perhaps consider moving the domestic stock to a 'Plutonium Fort Knox,' which the US could set up.

Liberal Democratic Party Member of Parliament, Taro Kono, was also on this panel, expressing completely opposite views from the speakers so far, and indeed from many in his party. He expressed a more immediate, practical set of reasons why the reprocessing policy in Japan continues, pointing out that the present law requires that all spent fuel must be reprocessed in Japan, but also that it is the job of lawmakers to change laws that are not appropriate. Budgets and vested interests are also another reason, especially as the main opposition party in Japan, the Democratic Party (DP), gains much of its support from utility company unions, making it even more difficult to raise opposing voices. A DP lawmaker was present in the audience and made the comment from the floor that not all DP members are receiving support from the utility unions and that bi-partisan opposition to reprocessing was crucial. In any case, Mr. Kono said that METI is the source of information for most MPs, who remain unaware of the huge problems with reprocessing and the existence of much better alternatives. Education programs for MPs are therefore desperately needed. Mr. Kono also flagged the situation in Aomori Prefecture, where spent fuel from reactors nationwide has been taken in anticipation of the commencement of operations at Rokkasho. If Rokkasho is abandoned, Aomori Prefecture's stance is that it does not want to become a nuclear waste dump and all the spent fuel it now holds must be sent back to the reactors it came from. Kono said that the government should, instead of starting Rokkasho, negotiate with the Aomori government to store the fuel at Rokkasho until a final repository, possibly at Minami Torishima Island, can be prepared.

Professor Hitoshi Yoshioka put Japan's plutonium policy in a historical context and again showed how outdated it has become and how, in a changing and increasingly unstable world, we can no longer rely on precedents of the past.

Session 2 brought up all of the main issues the conference aimed to address, and included many of the principal actors and major viewpoints in an open discussion. Although there was most certainly a spectrum of perspectives ranging from abandonment of the present policy and a moratorium on reprocessing, to possible postponement of Rokkasho, and to continuing the policy as valuable research and future insurance, there were also pockets of consensus, with speakers largely agreeing that the Japanese government must make its policy more comprehensible and concrete to America and the world, showing the importance of discussions such as these and the possibilities of moving forward on what often seems like intractable issues.

Regional and local, technical and cost issues

The other sessions expanded on the themes discussed in Session 2, focusing on the North Asian region (Session 3), technical aspects of plutonium disposal and associated costs, debunking the energy security argument (Session 4), followed by grassroots activism and solidarity, and the local economy in Rokkasho (Session 5). Speakers from Korea, Taiwan and China gave us updates on the state of reprocessing in their respective countries and confirmed that if there was to be a moratorium on plutonium separation in the region, Japan should take the lead, otherwise the suspicion and nuclear competition in the region would only increase.

In Session 4, Tetsunari Iida, the President of the Institute for Sustainable Energy Policy (ISEP) gave us all a definition of 'Energy Security,' from the 4 As: Availability, Accessibility, Acceptability and Affordability to the more recent concept of risk and resilience. He showed that renewable energy by far and away meets all of these criteria so much more efficiently than nuclear energy and particularly the nuclear fuel cycle. He showed that not only is there a viable alternative to the present nuclear and plutonium policy, the world is moving more and more in this direction because renewables actually provide better energy security than nuclear energy could ever do.

We heard from a German activist, Irmgard Gietl, via video message, in Session 5. She told us how one small town in Germany managed to defeat the project for a reprocessing plant back in the 1980s. Although the situation is very

different now in Rokkasho, participants were reminded of the importance of local grassroots action as well as international solidarity.

Future Challenges

The general consensus of the conference was that in 2018 the US-Japan Nuclear Cooperation Agreement would most likely be automatically renewed. While it seems very unlikely that Japan will request any changes, Henry Sokolski, the Executive Director of the Nonproliferation Policy Education Center, gave a very interesting presentation on the possibilities and processes whereby Congress may intervene in the renewal process. He gave past examples of where Congress had delayed, withdrawn or had renegotiated Nuclear Agreements with other countries. His point was that renewing the agreement will not promote US reactor exports and will likely promote a 'fissile production race' in the region. Furthermore 'Bob Corker, Chairman of the Senate Foreign Relations Committee, has called for a commercial plutonium production pause in East Asia. He has not endorsed automatic renewal of the US-Japan 123 agreement*.' Mr. Sokolski argues that if new legislation on the reprocessing of US-

origin spent fuel in China receives a high degree of attention in the US, then 'it is likely to make Japanese reprocessing and re-exportation of US nuclear design information matters of discussion regarding renewal of the US-Japan 123.'

In any case, PuPo2017 certainly renewed our resolve to continue to urge the Japanese government and other decision-makers to stop separating plutonium and to abandon the nuclear fuel cycle policy. Not only that, we also gained valuable insights into how we may forge alliances between stakeholders and create pressure on governments. We will be publishing the proceedings and results of PuPo2017 and making sure we build on the solid foundations laid by all the participants.

(Caitlin Stronell, CNIC)

* '123 Agreement' is another name for Nuclear Cooperation Agreements, so called because it is Section 123 of the US Atomic Energy Act which requires these agreements to be concluded in order for the US to transfer peaceful nuclear technology and materials to another nation.

PuPo 2017 Statement

Tokyo

24 February 2017

We, the undersigned, gathered in Tokyo from around the world for a two-day discussion of Japan's plutonium policy. The meeting brought together governmental and non-governmental stakeholders at community, national and international levels, with backgrounds ranging from engineering to law and diplomacy. We discussed Japan's plutonium policy as it relates to the US-Japan Nuclear Cooperation Agreement, which will reach the end of its 30-year term in 2018, in terms of US-Japan relations. In addition, we discussed the impacts that this agreement and Japan's plutonium policy have in the North East Asian region and the rest of the world. We recognize that Japan must make its own decisions about nuclear power in the best interests of its people, taking into consideration issues such as its effects on energy security and the environment. Yet Japan's plutonium policy has undeniable international and regional impacts, which, as a responsible nation, it must address in order to maintain regional and international peace, safety and stability. Japan clearly acknowledges this responsibility, as demonstrated by its international commitments—for example, in its joint declaration with the United States at The Hague Nuclear Security Summit in March 2014 where Japan mentioned "all Summit Communiqués' spirit to minimize stocks of nuclear material" and said it would "encourage other countries to consider what they can do to further HEU (highly enriched uranium) and plutonium minimization."

Some of the major conclusions we came to in our discussions were:

1) Many in countries neighboring Japan and the USA are deeply concerned about the security implications of Japan's stockpile of 48 tons of separated plutonium, as well as its plans to begin to separate up to an additional 8 tons annually at the Rokkasho reprocessing facility, starting in 2018. They regard this plutonium as both a proliferation threat, which could lead to heightened tension in the region, and a nuclear terrorism threat, due to its vulnerability to theft.

2) Although general awareness of the dangers of nuclear power generation has grown substantially since the Fukushima Daiichi accident, there is still a lack of interest on the part of the general public regarding the issues associated with reprocessing, including proliferation, nuclear terrorism, excessive cost and safety risks.

3) Reprocessing of spent nuclear fuel does not offer any advantages over storage and direct disposal with regard to radioactive waste management, energy security, or cost that would justify the major risks it poses. Japan should learn from other countries around the world that are pursuing safer, more secure and less costly alternatives – specifically dry cask storage pending deep underground disposal.

We therefore recommend that the governments of the United States and Japan:

Form joint commission(s), in the context of the US-Japan Nuclear Cooperation Agreement, to

1) Review the issue of the Rokkasho reprocessing plant in particular with regard to its implication for regional and international security.

2) Analyze ways of keeping Japan's existing separated plutonium safely and securely while mitigating the regional and international concern including the possibility of putting it under the Custody of IAEA.

3) Exchange information and analyses on plutonium disposition

And that the government of Japan, together with those of China and Korea:

1) Commit to a reprocessing moratorium in order to prevent the further accumulation of separated plutonium in the North East Asian region. Japan's government should lead the way by indefinitely postponing the startup of the Rokkasho reprocessing plant since Japan has already accumulated 48 tons of separated plutonium. Other governments in the region should follow this example by committing to suspend all activities and future plans to separate plutonium through reprocessing.

2) Conduct comprehensive reviews, during the moratorium/pause, on all aspects of their nuclear fuel cycle policies investigating alternatives for spent fuel storage and disposal. These reviews must involve independent third-party experts and must include all stakeholders. There must be vigorous public debate, in the media and other fora, with full disclosure of all information and data. All governments involved should respect the conclusion of these reviews and make changes in their plutonium policy according to their recommendations.

HASEGAWA Koichi
 SUZUKI Tatsujiro
 Robert GALLUCCI
 KONO Taro
 Steve FETTER
 YOSHIOKA Hitoshi
 KANG Jung Min
 KIM Hye Jeong
 Gloria Kuang-Jung HSU
 Henry SOKOLSKI
 Edwin LYMAN
 BAN Hideyuki
 Frank VON HIPPEL
 IIDA Tetsunari
 ASAISHI Koji
 CHINO Tsunehide
 YONEMOTO Shohei
 SASADA Takashi
 Shaun BURNIE

**Please see CNIC's website for conference presentations:
www.cnic.jp/english/?p=3713**

PuPo 2017 Photo Gallery



Keynote speakers Robert Gallucci and Tatsujiro Suzuki



Session 2 speakers: diverse opinions at the same table



Session 3 speakers: Kim Hyejeong, Gloria Hsu, Zhu Xuhui, Kang Jungmin and Henry Sokolski



Hideyuki Ban and Tetsunari Iida from Session 4



Koji Asaishi, Tsunehiro Chino and Session 5 moderator Takashi Sasata, with Klaus Striegel on Skype



Press Conference with Tatsujiro Suzuki, Mycle Schneider, Heryn Sokolski, Frank Von Hippel, Edwin Lyman

All photos by Ryohei Kataoka, CNIC

NEWS WATCH

FNCA Symposium

The Forum for Nuclear Cooperation in Asia (FNCA), in which Japan's Cabinet Office and the Ministry of Education, Culture, Sports, Science and Technology play a central role and which promotes cooperation in nuclear power technology among the countries of Asia, held a symposium in Tokyo on February 13 to consider Japan's future role. Twelve countries: Japan, Australia, Bangladesh, China, Indonesia, Kazakhstan, South Korea, Malaysia, Mongolia, the Philippines, Thailand and Vietnam, participate in the FNCA, whose activities include ministerial level meetings, coordinator meetings, panels and projects. The projects mostly emphasize the uses of radiation.

About 100 people from 10 countries participated in the symposium, reporting research results on uses of radiation, such as for treating cancer or in radiation breeding. The Philippine delegation appeared to urge the preparation of a 10 MW research reactor in anticipation of a need to cultivate human resources for nuclear power plants. In the panel discussion on Japan's role, one request after another was made for assistance, such as "Education is the basis for everything, so we would really like support from a country with knowledge," and "Human resources should be cultivated through the FNCA."

Horizon Nuclear Power of the UK Teaming up with Exelon of America

Horizon Nuclear Power, a fully owned British subsidiary of Hitachi, Ltd. announced on February 15 that it had formed a cooperative partnership with Exelon Generation International of the US, a subsidiary of Exelon Corporation, regarding plans to build a nuclear power plant (NPP) at the Wylfa Newydd site on the island of Anglesey in Wales. Exelon is America's largest company in the NPP field, with experience operating 22 reactors, 13 of which were BWR.

With the Wylfa Newydd plans, Horizon Nuclear Power expects to construct at least 2,700 MW of ABWR capacity in Britain. It aims to begin operating the first of these reactors in the first half of the 2020s. As this constitutes the company's first nuclear energy project, it has therefore been seeking cooperative partnerships with a number of countries overseas to operate the NPP successfully after its completion. The main fields in which Horizon expects to benefit from the transfer of the partner's superior skills as an NPP operator are operation and maintenance management of NPPs, training of human resources, BWR operating

experience, and specialist knowledge of licensing in the UK.

The company had previously entered into a cooperative agreement with the Japan Atomic Power Company on July 7, 2016. They are cooperating in activities to assess the costs of constructing the NPP, as well as Engineering Procurement Contracts (EPC) for construction, and in gaining approval for things like siting and drawing up plans for test operation and all forms of maintenance. The Japan Atomic Power Company is considering business collaboration with Exelon Generation International, and is expected to participate in the management of the Wylfa Newydd NPP once it starts operating.

Malfunctioning Crane at Tokai Reprocessing Plant Halts Vitrification

The Japan Atomic Energy Agency's Nuclear Fuel Cycle Engineering Laboratories announced on February 17 that remote control equipment had malfunctioned during operations to vitrify high-level radioactive wastes being stored at the Tokai Reprocessing Plant, causing the vitrification facilities' operations to be halted. An accident occurred at these same facilities on March 30, 2016, in which a crane being used to transfer the prepared vitrified bodies to storage cells malfunctioned, failing to release a vitrified body in its grip. As a result, four vitrified bodies could not be placed in storage. Vitrification was halted again right after its resumption on January 30, 2017 after a 10-month hiatus.

According to the laboratories, it was the same crane this time that malfunctioned. On February 13, it started making strange noises, and on the 14th, an overcurrent was detected. On the 16th, a worker entering one of the cells enclosed by concrete walls to investigate it identified the crane's clutch as the source of the strange noises. That day at 9:00 p.m., electricity was shut off to the smelting furnace where the liquid waste is mixed with glass materials, and vitrification was halted. Operations resumed on 18 March 2017.

Further Delays in Investigating Fukushima Unit 2 Reactor Interior

TEPCO sent a self-propelled investigative robot, dubbed "Sasori (scorpion)" into the Fukushima Daiichi NPP Unit 2 reactor on February 16 after a year-and-a-half delay, but its left-side caterpillar tread froze up as it travelled along an equipment replacement rail into the interior of the reactor vessel, leaving it unable to traverse the rail and

transfer onto the scaffolding where it was to perform its work. It could not be recovered, either, so the investigation was called off, its cable was cut, and it was abandoned on the rail.

TEPCO was able to get radiation level and temperature readings, and praised its own efforts for the “remarkable world’s first” distinct footage of the reactor interior. It also claims that the inability to recover the robot was within expectations and “not a failure.” With it being the world’s first such accident, it’s no wonder they achieved a world’s first in responding to it.

TEPCO Notifies Major Canadian Uranium Firm of Contract Cancellation

The major Canadian uranium producer Cameco announced on February 1 that it had received a notification from TEPCO that its 1.3 billion Canadian dollar uranium supply contract was being cancelled. Cancellation of this contract means that fate of the approximately 4200 tons of uranium to be supplied until 2028 will be up in the air. Cameco is indicating that it will take legal action against TEPCO for breach of contract.

Toshiba’s NPP Deficit Grows Ever Greater

Toshiba decided on February 14 that it was delaying its statement of accounts, which was scheduled to be announced that day, by one month to give it time to investigate accounting irregularities that had been revealed by a whistleblower at its subsidiary Westinghouse (WEC). Instead, it announced results indicating an outlook for a 712.5 billion yen deficit in its NPP business. It decided to reduce its 87% stake in WEC, but on the 16th, IHI Corporation sent notice that it would exercise its put option on 3% of the shares held. Toshiba accepted that on the 17th, announcing that it would buy them this coming May 17 (the remaining 10% are held by Kazatomprom). On the 22nd, a U.S. electric utility provider said it had been requested by WEC to delay the construction of Units 3 and 4 of the “Plant Vogtle” NPP in Georgia. It has likewise requested a delay for Units 2 and 3 of the Summer NPP in South Carolina, and the increased costs of this will be borne by WEC and Toshiba.

Hitachi Also Expecting Loss in US Nuclear Energy Business

In its statement of accounts for the fiscal year ending March 2017, Hitachi announced on February 1 that it was making allowances for a 70 billion yen loss in its earnings forecast in connection with its nuclear energy business in the US. GE Hitachi Laser Enrichment, a subsidiary of GE Hitachi Nuclear Energy (GEH), which is 40% owned by Hitachi and 60% by GE, has abandoned uranium enrichment technology development, and because it could not acquire the earnings it had expected, Hitachi has taken a loss of 70 billion yen on the 80 billion it invested in GEH.

Hitachi explains that because GEH was unable to acquire future earnings that had been anticipated from uranium enrichment using the new technology that was under development but has now been abandoned, the price of the GEH shares Hitachi held has fallen.

Kashiwazaki-Kariwa NPP Anti-seismic Building Insufficiently Quake-proof

At a meeting to examine Kashiwazaki-Kariwa NPP Units 6 and 7 on February 14 for compliance with the new regulatory standards, TEPCO revealed the possibility for the first time that the key anti-seismic building, which was expected to serve as a center for emergency response in the event of a severe accident, might not be able to withstand even half the level of shaking of the anticipated strongest earthquake (standard seismic motion). Emergency response headquarters were to be established in both the key anti-seismic building and Unit 5 reactor building for combined use, because based on the results of a simple analysis, if part of the longer-period seismic motions were excluded, the building would be capable of withstanding the tremors, but a trial calculation in 2014 revealed that not all tremors could be withstood. These results were not conveyed to the personnel in charge of handling the examination. Japan’s Nuclear Regulation Authority expressed distrust of TEPCO, including its technical capabilities, for its severe organizational “illness.” On February 28, they called the company president and directed him to resubmit the application for examination.

Proposal for Approval of Japan-India Nuclear Cooperation Agreement Submitted to Diet

The cabinet adopted a proposal on February 24 for approving the Japan-India Nuclear Cooperation Agreement and submitted it to the Diet. This Agreement was signed by both countries when Indian Prime Minister Modi visited Japan on November 11 last year (News Watch No. 175). See NIT No. 174 for a detailed look at problems with the deal.

FNCA Symposium

Horizon Nuclear Power of the UK Teaming up with Exelon of America

Malfunctioning Crane at Tokai Reprocessing Plant Halts Vitrification

Further Delays in Investigating Fukushima Unit 2 Reactor Interior

TEPCO Notifies Major Canadian Uranium Firm of Contract Cancellation

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Who's Who

Tetsuji Imanaka: Nuclear Scientist Activist

by Masako Sawai *

Tetsuji Imanaka was born in Hiroshima in 1950, a second generation hibakusha. In the post-war recovery period, energy was a big problem in resource-poor Japan and many young people saw nuclear power generation as a dream solution for the future. Mr. Imanaka was one of them. He entered the Faculty of Engineering at Osaka University, majoring in Nuclear Engineering and then studied at Tokyo Institute of Technology, but he became more and more aware of the many problems involved with nuclear power generation. As Mr. Imanaka himself recalls, "I was taken in by the fantasy of the time that nuclear power would forge the future of Japan." This was despite the technical as well as social difficulties that existed right from the beginning and which made nuclear power far from the 'cutting-edge technology' it was made out to be.

He began working at the Kyoto University's Research Reactor Institute and conducting research in such areas as environmental impact assessment of radioactivity from nuclear facilities and neutron dose evaluation of the Hiroshima and Nagasaki atomic bombs. He has devoted himself to 'research that will be useful in stopping nuclear power generation by clearly showing its negative aspects' in precise scientific terms.

As a member of a group of experts in Kyoto University's Research Reactor Institute, he is involved with Japan's first 'anti-nuclear lawsuit' against Shikoku Electric Power Company's Ikata Nuclear Power Station. This legal action has exposed the situation of a pro-nuclear government which disregards even safety inspections. He has also worked with a group in Wakayama, which opposed the proposal to build a nuclear reactor in that prefecture, and succeeded in defeating the proposal and keeping Wakayama nuclear-free. He has worked with many other local activists opposing construction of nuclear reactors in their communities, giving them vital scientific advice.

Mr. Imanaka has also visited Chernobyl several times to conduct research and has published many papers on this, commenting that: "When a major nuclear accident occurs, surrounding communities are completely wiped out. The basis of their livelihoods is robbed from them, unemployment



Photo credit: Naomi Toyoda

and mental stress cause double and triple layers of hardship. Only a very small proportion of this pain and suffering can be shown through a scientific approach." This describes the present desperate situation in Fukushima. Of course Mr. Imanaka has been conducting research on radioactive contamination and exposure of Fukushima residents, visiting affected areas regularly, starting from straight after the disaster occurred.

In particular, Mr. Imanaka has been involved with a survey of the Iitate Village area of Fukushima, which suffered high levels of contamination due to the Fukushima Daiichi nuclear accident. However, evacuation orders were delayed until the end of May 2011, more than two months after the accident began, resulting in the residents of Iitate being exposed to radiation for this entire time. Mr. Imanaka's research, including conducting resident questionnaires, shows clearly that Iitate residents have been exposed to higher doses of radiation than residents of other areas of Fukushima Prefecture.

**Staff member of CNIC; Member of Mr. Imanaka's research project on initial stage radiation exposure at Iitate Village*

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

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