

Confronting Reality: Experience from Fukushima Tour

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I. INTRODUCTION

The past five years have seen numerous efforts in recovering from the accident at the Fukushima Daiichi nuclear power plant (FDNPP). At the FDNPP, all fuels were finally removed from the spent fuel pool of Unit 4, and investigation works inside the reactor buildings of Unit 1, 2 and 3 has started by using advanced technologies such as crawler robots and muon tomography. In the areas surrounding FDNPP, which were affected by the accident, a great deal of resources has been devoted to decontamination works, which has contributed to shrink the evacuation areas gradually.

Despite these progresses, there are still a number of challenges to be overcome. Almost 100,000 people are still away from their home; final disposal methods of contaminated soil and waste have yet to be determined; and, needless to say, decades of efforts will be needed towards entire decommissioning and recovery.

As young nuclear professionals living in the world after the accident, we have to better utilize nuclear technology for the welfare of mankind in the future, seriously bearing the lessons from the past in mind.

In this regard, Young Generation Network Japan (YGNJ) is committed to disseminate information of and sharing lessons learned from the accident at FDNPP, including our experience in recovering from the accident, to the young generation in Japan and around the world. We believe that one of the best ways for learning lessons is to visit the site for experiencing *realities*. In practice, however, we have a limited opportunity to visit FDNPP site and the evacuation areas.

To bridge this gap, YGNJ coordinates Fukushima tour as one of the key pillars of our international activities. We provide a package of 2-days study tour to better understand actual situations at both on-site and off-site FDNPP. In September 2014, YGNJ welcomed Swedish YGN and coordinated their Fukushima tour. Our second tour was in February 2016, with IYNC Ex-Com and other YGN colleagues from Asia-Pacific region. This paper provides the outline of our second Fukushima tour and its brief reflection.

II. OUTLINE OF FUKUSHIMA TOUR

Our second Fukushima tour was held on February 1 and 2, 2016. 21 young professionals from Europe, North America and the Asia-Pacific participated in the tour, accompanied by an interpreter and 3 independent journalists.

A. 1st Day: FDNPP On-site Tour

We took 3 hours bus-ride from Tokyo to FDNPP, which is located 220km north of Tokyo. All the visitors to FDNPP are

required to drop in a facility called *ōJ-Village* for making the necessary preparations. J-Village was originally founded as the first training center for Japan national football team, with donations from TEPCO, and it has functioned as logistical base for accident response since March 2011. Currently, around 7,000 workers make use of this facility every weekday including employees from TEPCO and its contractors.

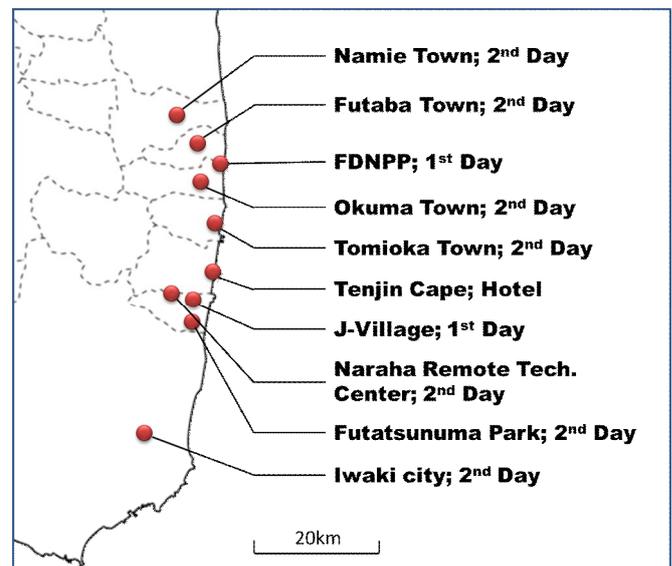


Figure 1. Destinations of Fukushima Tour

At J-Village, TEPCO gave us a briefing on current status of and major issues at FDNPP, including their roadmap towards decommissioning. One of the major topics focused in the presentation was contaminated water issues. According to their explanation, approximately 300 tons of ground water flows into the reactor buildings area per day, aside from the cooling water which is continuously recirculated inside the PCV, therefore the amount of contaminated water increases day by day. TEPCO pointed that their countermeasures are based on the following three basic policies; removing source of contamination, isolating ground water from contamination sources, and preventing leakage of contaminated water.

After the briefing, we headed to FDNPP by a dedicated bus with TEPCO's guides. In the access control facility at the gate of FDNPP, we were provided the necessary equipment including a simple mask, cotton gloves, plastic shoes cover and an electric personal dosimeter. Contrary to popular image, it is not necessary to wear protective clothing and full-face mask because air concentration of radioactive materials in the site, except inside the reactor buildings of Unit 1-4, is below detectable limit.

In the 80 mins full-guided bus tour in the FDNPP site, we saw various locations; building cover installed over Unit 1, giant cranes for handling fuels around/on Unit 3, massive structure for sustaining fuel pools of Unit 4 made by huge amount of steel (almost same as the amount for the Tokyo tower), numerous tanks filled with contaminated water, multinuclide removal facility, reverse osmosis concentrated water treatment facility, sea-side impervious wall, large rest house for site workers, and so on. Our personal dose of this whole tour was below the detection limit of 1 Sv, although the maximum air dose we measured was approximately 300 Sv per hour near Unit 4.



Figure 2. Group photo in J-Village

B. 1st Night: Stay near FDNPP

We stayed at the hotel in Naraha town, which is closest one to FDNPP, with great ocean views and Japanese style hot spring. After its closure for 3 and a half years, the hotel was reopened in September 2015, following the lifting of the evacuation order to the town, and with the presence of Prime Minister Shinzo-Abe.

Experienced a dinner with locally grown ingredient, we had two after-dinner talks provided by two key persons in Fukushima; Mr. Hiroshi Kainuma and Mr. Akihiro Yoshikawa.

Mr. Kainuma, young but well-known sociologist born in Fukushima and works at Fukushima University, showed the current situation and challenges in Fukushima prefecture from the sociological viewpoints using quiz format. His first question was “what percentage of the population left Fukushima due to evacuation?” The answer was 2.3%, which was much smaller than many participants had anticipated.

The second presenter Mr. Yoshikawa, who had over 10 years of working experience in FDNPP and Fukushima-Daini NPP, spoke vividly what he felt when the huge earthquake hit the NPP. After the accident, he left TEPCO and established an NGO called “Appreciate Fukushima Workers (AFW)”. The main purposes of AFW are to provide first-hand information regarding situation at Fukushima, to support local business, and to organize technical tours in FDNPP, which are similar to YGN’s course of action.



Figure 3. Radiation counter in the hotel, Naraha town

C. 2nd Day: Off-site Tour around FDNPP

The second day started with a short walk to the Tenjin cape, near the hotel. We were stunned by what we saw from a sea-side hill, innumerable flexible container bags filled with contaminated soils and waste. While it was originally a host of small agricultural communities with well-fertilized fields, the lowland areas on the south side of the cape transformed to a temporary storage site of decontamination waste, after the tsunami washed out everything. We also viewed two offshore wind turbines, which are parts of the pilot project of floating wind power in Japan. It could be a symbol of movement away from the dependence on nuclear energy in this area.

Next visit was the Naraha Remote Technology Development Center of Japan Atomic Energy Agency (JAEA). This Center has the purpose of developing the remotely-controlled robots for decommissioning FDNPP. We saw a real scale mock test of PCV bottom of Unit 1, as well as a virtual-reality system made with real CAD data of the reactor buildings of FDNPP. Mr. Yoshikawa shared us that he was impressed by the preciseness of this VR system, recalling his experiences of working at the FDNPP. This system is expected to help TEPCO to make decommissioning plan including dose estimate for workers. Activities at this Center might be a sign of great deal of technological and economical resources in our country dedicated to the response to this accident.



Figure 4. View from Tenjin Cape, Naraha town: Hirono thermal power station and temporal storage site of contaminated waste

The afternoon of the 2nd Day was spent for getting a brief glimpse of disaster-stricken areas around FDNPP.

At the Futatsunuma Park, in front of the Hirono thermal power station, also operated by TEPCO, Mr. Yoshikawa showed us the olive trees that local people planted after the accident with putting their forlorn but earnest hope to revitalize their home town someday. Some of these trees beard a lot of olive fruits after 3 years they were planted, that could be a silver lining for future.

In Namie, Okuma, Futaba, and Tomioka towns, we looked around the actual situation of the areas where residence is prohibited. These 4 towns have been completely within the exclusion zone after the accident, and the evacuation order is still in effect. Currently, these towns are divided according to radiation levels into three areas; i) Areas for which evacuation orders are ready to be lifted, ii) Areas in which residents are not permitted to reside, and iii) Areas where it is expected that former residents will face difficulties in returning for a long time. In the areas i) and ii), only day-time visits are allowed.

While the overall situation is still complex and difficult, we saw a certain number of progresses in this area. For example, we can drive the Joban expressway from Tomioka to Namie interchange. This section was constructed after the accident and newly opened in March 2015, with six radiation counters alongside the road. In addition, the ruins of Tomioka station, which was fully destroyed by the tsunami, was finally cleaned up. This severely damaged station had been a symbol of the misery of complex disaster of tsunami and nuclear, as it had been left damaged over 4 years.

On the other hand, we grasped that many restaurants and supermarkets in the central Tomioka town were preserved as they were at the time of accident, but covered with dust. We also witnessed the difficulty of bridging the gap between social image and the reality. In Namie town, we visited a roadside place where many cars were derelict in the grass. Web news reported that these cars were abandoned by evacuees in the midst of disruption after the accident. In reality, however, this place had been used as an automobile graveyard before 2011.



Figure 5. Closed supermarket and decontamination waste, Tomioka town

III. REFLECTION AND FUTURE

In our Internet era, once we googled Fukushima, we can easily obtain numerous information. We believe, however, that it is vital to see with our own eyes and to hear firsthand voices for finding out the realities of nuclear disaster where technological, political and societal factors are tangled up complexly.

We realized that the reality is mixture of progress and stagnation, change and immutableness, and hope and desperation. Some YGNJ members, who had visited FDNPP and affected areas several times, were impressed by both which had changed and which had not yet changed. We cannot say that everything goes well, while it is an exaggeration to say that nothing is going right direction. The truth exists somewhere in the middle, whose boundary varies from day to day.

This complex nature of reality after the accident is never easy to understand, even by Japanese nuclear community. Delivering proper package of information about it to citizen across the globe is another big but remaining challenge. While it may not be fully understood by everyone, YGNJ is determined to continue arranging the Fukushima tour for young nuclear professionals, expecting them to better learn from the past.

Fortunately, Japan is promoting the policy for Tourism-Oriented Country. While Tokyo is still evolving towards Olympic game in 2020, Fukushima has great local products such as rice, sake, fish, fruit, and so on. Visiting Fukushima and tasting local foods and drinks can be of some help for understanding the realities.

Young nuclear professionals are always welcomed to visit Japan and Fukushima. YGNJ will be willing to support for you. Please also visit our webpages below;

<http://www.ygnj.org/>
<https://www.facebook.com/ygnjapan>

ACKNOWLEDGMENT

Our sincere appreciation goes to Mr. Kainuma, Mr. Yoshikawa, TEPCO, as well as all the participants of our Fukushima tour for their contribution to the tour. This activity was supported by Atomic Energy Society of Japan.