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I am from Japan. I am Nishida, Mayor of Date City.
I am so honored to have an opportunity to take part in this IAEA Meeting and deliver this presentation.
In my presentation, I would like to talk about "Measures taken against the nuclear disaster in Date City", and the implementation process.

Date City is located in Fukushima Prefecture in the Tohoku District, Japan. The population of Fukushima Prefecture is about 2 million, and it is about 200 km away from Tokyo.

The population of Date City is 65,000 with 22,000 households. Date City is a main producer of fruits, and we produce a variety of fruits, such as peaches and apples.
We were hit by a great earthquake, which is said to occur once a millennium, and 8,000 households were damaged, and 2 large elementary school buildings collapsed in Date City. Even now, one of the damaged schools is still giving classes at a temporary school building.

Please look at this chart.

This shows the location of Date City in Fukushima Prefecture. It is 60 km away from the nuclear power station. The recent earthquake triggered a huge tsunami on the Pacific coast, and the area in the chart was devastated by the tsunami, causing about 20,000 casualties. The tsunami did not reach Date City, but we came to suffer from radiation due to the disaster.

Next, please look at this chart. All power sources of the Fukushima Daiichi Nuclear Power Station were shut down due to the tsunami, and the reactors were unable to be controlled. Consequently, radioactive substances leaked outside the facility and reached Date City being blown by the wind after the accident.

This was really an unprecedented situation to us, and we were completely in the midst of confusion.

Please look at this chart.

Around 2:46 p.m. March 11, 2011, when I was working in the Mayor's Office, the Great East Japan Earthquake suddenly occurred and the ensuing tsunami disabled reactor control.
Then, around 7:03 p.m. the National Government issued the "Declaration of a Nuclear Emergency Situation".

At this time, all houses and buildings lost power, but fortunately the City Hall was not cut-off. I was watching TV and felt the occurrence of emergency, but I did not feel that Date City would be affected.

As the timeline in the chart shows, the situation worsened. The evacuation order zone extended. Unexpected hydrogen explosions repeatedly happened. I was scared as dreadful events were occurring, but also felt assured because Date City was outside the 30 km zone and 60 km away from the NPPS. I wrote down these thoughts in the 1st issue of "Date City Disaster Response Process" published in March 21.

Please look at the next sheet.
However, on March 23, the National Government suddenly released SPEEDI.
When I saw the chart, I had a sense of crisis that Date City was also in danger, for the first time. As it turned out afterward, a radioactive plume reached Date City blown by the wind on the 14th , and then fell down to the ground with the snow that night.

In fact, this was a completely new experience for us, and we were not at all prepared for radiation. We had neither knowledge on radioactivity nor radiation counters. We even did not know if radioactivity was affecting us or not. We found out that a nearby fire station was equipped with a counter. On March 31, we were able to measure the radiation levels for the first time. At that time a fire fighter said, "This radiation counter is broken because this needle has never ever moved whenever I turned it on." I said, "Anyway, turn it on." The needle sharply moved up. When he saw the needle moving, he said, "This counter is not broken." It was not important that we found out that the counter was not broken, but what was important to us was that radioactivity was already present around us.
Later on, some mentioned that the radiation levels of school grounds was high, and parents worried about it. Eventually, Date City was in need of taking measures to

safeguard children.

In addition, on April 22, the National Government designated adjacent Iitate Village as a planned evacuation area, which was a mandated evacuation order. Right after that, the chief cabinet secretary remarked that Date City has areas the same as Iitate Village on TV. When I watched it, I was astonished. Since there was no specific instructions from the National Government, Date City independently took measures to encourage voluntary evacuation and helped residents evacuate from their homes. After that, the National Government designated Date City as a Specific Spot Recommended for Evacuation. Amid such circumstances, we discussed the pros and cons of evacuation, focusing on the issue of when people would be able to return to their homes. The timing for return is of course when radiation levels declined to below the safety standards. We thus all confirmed the necessity of 'decontamination' for our returning. We even did not know the word, 'decontamination' at all. We learned of decontamination methods when reading documents on Chernobyl.

Moreover, we needed to take immediate action for prevention of radiation exposure, so we hurried to implement measures. Basically, we have to ask the National Government to give us instruction if we do not know how to deal with problems that arise in out duties. Despite that, the National Government did not answer our questions because they knew nothing about such unprecedented situations and could not take any action themselves. The National Government had a basic concept to take perfect actions even if the progress was slow and delayed.
Thus, we decided that we should not depend on the National Government, and that we had to take our own independent actions.

Meanwhile, the National Government stated that outdoor activities at schools were permissible for up to 3.8 μ Sv/h equivalent to 20 mSv/yr. We decided that we needed to decontaminate the school grounds for children because it was no good for the children just to keep them indoors for their safety. We conducted demonstrative experiments on the effect of removal of surface soil and found out that Cesium was deposited within the top 5-cm of the surface soil. Following this result, we removed the surface soil of Oguni and Tominari elementary schools both of which were highly contaminated, and saw a significant effect in radiation reduction. At that time, we discussed the problem of where to keep the removed surface soil that was radioactive -waste, and decided to temporarily pile it in the school grounds.

Following this work, Date City independently started decontamination works for gardens of all elementary, junior high schools and kindergartens. We thought that the piling of radio-contaminated soil was problematic, and developed a method to bury the contaminated soil under the ground and cover the surface with fresh soil (uncontaminated soil). We applied that method thereafter.

In July, we thoroughly decontaminated school pools. Mr. Shunichi Tanaka, an expert of atomic energy came to help us along with the PTA. As a result, in the summer after the disaster, children of Tominari elementary school which showed the highest radiation levels were able to swim in the pool. It was very meaningful in terms of the "recovery of confidence in scholars".

Around that time, "the confidence in scholars" was completely diminished. There were many conflicting opinions among scholars; some increased the sense of crisis and others gave no comment because they did not have data of health damage caused by low radiation level.

Mr. Shunichi Tanaka was later appointed as the current chairperson of the Nuclear Regulatory Commission.

In the meantime, test decontamination work was conducted for private houses, generating the radioactive-waste of 30 tons or over per house. We realized that we had to prepare temporary storage sites to prepare for full-scale decontamination work. Despite that, we have a hard time gaining understanding from residents concerning the temporary storage sites.

The temporary storage sites are a prerequisite for transportation to "interim storage facilities" which are being examined by the National Government. There are more than 90 temporary storage sites in Date City.

Please look at this chart.
This is the situation of removing surface soil from school grounds. We requested the removal of 10cm of the surface soil using bulldozers. The radiation levels of the school grounds decreased from 5 μSv or over to 0.88 μSv at the height of 50 cm from the ground. For asphaltic school routes other than school grounds, still now, we have to decontaminate by shot blasting. Also, we need to remove weeds and plants on slopes by

hand because now we know that radiation level of the grounds never decreases due to the radiation produced by the slopes.
This is the situation of decontaminating the school pool.
The chart below shows that they are temporarily putting radioactive-waste under the school ground.

Next, let me explain about decontamination for living areas.
From the standpoint of quick implementation of decontamination in living areas, Date City made a plan to divide the whole city into 3 areas of A, B and C according to the radiation level after monitoring the whole area of the city, and decontaminate the areas on a scale based on the radiation level. Area A refers to areas with an annual dose of 20 mSv or over. Area B refers to areas with an annual dose from 5mSv up to less than 20 mSv. Area C refers to areas with an annual dose of less than 5 mSv. To be more specific, the Area A is categorized to be a restricted area for inhabitance. We have about 2,500 households in Area A. We placed an order for construction fees of 14.9 billion yen, which costs 6.5 million yen per household. It is indeed a huge amount. Area B has about 3,700 households whose construction total is 9 billion yen, which is 2.5 million yen per household. Area C has about 16,000 households accounting for 70 % in the city. Its construction fee costs 1 billion yen which is 60,000 yen per household.
For the Area C, we apply a method to decontaminate only hot spots. The areas with a radiation level of 3 μ Sv/h at 1cm high are supposed to be decontaminated. Currently the work is being conducted smoothly and will be completed by March, this year.

This chart shows the Decontamination Promotion Center. We established this center with an aim to help residents voluntarily decontaminate areas with relatively low radiation level through leasing necessary tools and giving guidance. The center is a hub for decontamination of Area C.

Next chart shows the situation of temporary storage sites of radioactive waste. It is located in a wide site in the mountains. Among the objections against the set-up, we had an opinion that setup in the urban area was fine as far as safety was assured. This is a site set up at the southern part of parking lot in the city hall, following this opinion.

Next is the situation of decontaminating hot spots. Hot spots are likely to be made below gutters. Since safety is assured by partially removing contaminated soil and filling in fresh soil, we removed contaminated soil from several places at most per

household and monitored radiation levels before and after the decontamination works to reassure local residents.

Next, I would like to talk about a problem related to the decontamination process. Although decontamination work has taken place, “safety and reassurance” in residents’ mind are not equal.
From our experiences, it is observed that residents are likely to be reassured when decontamination work was thoroughly carried out or earnestly conducted without regard to the level of radiation dose. Particularly, mothers having children and grandparents having grandchildren were not fully reassured unless decontamination was completely implemented.
Residents in Area C affected by lower radiation level are more fearful than those living in other areas. They want more thorough decontamination work. There is no need for further decontamination, but more and more residents are calling for further work. On the contrary, residents in areas affected by higher radiation level were satisfied with the thorough decontamination work despite the fact that radiation levels did not significantly drop.

A current problem of target radiation level for decontamination is a misunderstanding of the target radiation level by local residents. The National Government set a long-term target radiation dose at 1 mSv/year. Then residents believed that the annual radiation dose should be below 1mSv. Accordingly, local residents strongly demanded that the radiation level achieved by decontamination should be below 0.23 μ Sv/h in terms of air dose which is calculated from 1mSv/yr. This is a most pressing issue for us.

For my 4th argument, I would like to talk about measures for children. Parents were very much worried about their children because the radiation effect on children is severer than that on adults. Therefore, children were encouraged to wear long-sleeve clothes, caps and masks; the school kept windows closed; and more and more parents did not allow their children to play outside. As mayor, I issued a discretionary decision for 1 billion yen of budget on May 26. This budget was aimed to cover expenses for equipment of air conditioners so windows should be kept closed, management of actual dose children were exposed to by providing glass badges for children and decontamination of the school ground.
These measures recovered trust for administration from local residents who were dissatisfied with the slow-space in taking actions. Although the school premises were

decontaminated, other areas fell behind in terms of decontamination work. We began operating school buses for children to prevent them from radiation exposure along the school routes. In addition, we started a summer school for children to relax both physically and mentally in a place far from Date City where they were free from the fear of radioactivity. 2,050 children participated in the summer school in 2011. We also established an indoor playground for children to play without fear, and another indoor playground is under construction.

Now, I would like to talk about the 5th issue, external exposure.
For the external exposure, we basically applied glass badges. As I mentioned earlier, we started measuring the dose of 15,000 residents such as those in Area A, pregnant women and children from June in the year of the disaster.

The National Government planned to measure exposure doses of residents in high-radiation areas, but Date City decided to measure the external exposure of all children in the city including areas of low radiation level, so the total numbered 15,000 residents.

Further, we had all citizens wear glass badges for one year from July 2012to June 2013. The National Government decided that residents in Area C did not have to wear glass badges and we agreed with them, but actually not all residents felt reassured by this decision. Accordingly, for the sake of residents' reassurance, we had them measure the dose by themselves and confirm external exposure did not exceed 1mSv/yr for their relief. I will tell you about the results later on.

At present, in addition to 15,000 residents who initially wore glass badges, we delivered them to a certain number of residents and applicants in Area C with lower radiation levels as sampling in order to observe the progress. Currently, 25,000 residents are wearing the glass batches in total.

From August in 2011, we quarterly conducted monitoring in the whole city over a 1 km mesh and have been making a radiation map. This map helps citizens understand the reduction of radiation level due to the half-life of cesium and gradual decline of overall air dose by promotion of decontamination work as well as enabling citizens to act based on the knowledge concerning places with high radiation levels. We deliver this map to all households. In addition, we regularly measure and disclose measurements of air

doses at main public facilities to help citizens pay attention to doses of nearby places. This is the radiation map.
When comparing colors of the radiation monitoring map made in August, 2011 and one made in March, 2013, the color has turned lighter as time has passed. You can see the radiation doses have declined that much. A, B and C mark a rough classification.

Regarding the 6th issue, internal exposure, we finished examination using whole body counters of all citizens by March, 2013. Now examinees are on the second round. We prepared 3 WBCs for the second examination. For food inspection, we installed examination instruments at 16 places in the city. This service is for citizens who wish to inspect foods for their diet at home and know that food is safe for eating. We release data measured by citizens through public relations magazines to citizens to inform the origin of produce and the levels of radioactive substances contained. Agricultural products for commercial use must go through stricter inspections before sale.

However, the Japanese standard, which is 100 BQ/kg is too strict when compared with the EU standard, which is 1,200 BQ/kg, causing greater anxiety among citizens. I think this is a big problem.

For the 7th issue, I would like to talk about data analysis of glass badges.
We analyzed the results of measuring for all citizens that I mentioned before. 52,783 citizens continued the measuring for one year, and those less than 1mSv/yr of additional exposure dose accounted for 66% and those less than 2mSv accounted for 94%, showing that most of them were fine.

Date City independently set a target radiation level at 5mSv in real term, and had 76 citizens exceeding 5mSv. We think it is necessary to know the working places of the 76 citizens, and manage the conditions. Another thing we found out was that the relation between air dose and measured exposure dose was half the value calculated by the National Government. To be more specific, the air dose of 0.23 μSv/h is presumed to result in an exposure of 1mSv/yr, but we gained data that even double the said value did not exceed 1mSv/yr. We knew that coefficients in formulas applied in Japan and Chernobyl were different by double, and now we assume that formula used in Chernobyl is both theoretically and realistically correct.

There was no citizen over 5mSv/y and few over 3mSv/y among those younger than 15

years old, meaning safety measures for children were all successful. Please look at this chart. This shows annual exposure dose by age. No children from 0 to 15 years of age fall into over 4mSv. The next chart shows air doses reaching 1msV/yr. When plotting 50,000 examinees in all ages, the slope is shown in the upper graph. The lower chart includes only children's information, the slope looks more gradual. We can say that measures for children were successful.

That's all for my presentation. Lastly, I would like to extend my appreciation for instruction and support by IAEA.
In this invaluable opportunity, I have one request to officials of IAEA.
Since the standard for health management against radioactivity is not clear, citizens are not able to perceive "safety equals reassurance" in their mind. The National Government only set 1mSv as a long-term target without stating a realistic standard. I think such statement is a main factor to cause confusion among evacuees wanting to return home.
It is really affecting evacuees' decision to return to their homes.

I would be grateful if IAEA would expressly indicate that 5mSv/yr is permissible for the safety standard for the time being.

Now, I would like to finish my presentation. Thank you very much for your attention.