Appendix

Outflow of radioactive water from the concrete crack near intake canal for Unit 2 of Fukushima Daiichi Nuclear Power Station

1. Evaluation of the fact

At around 9:30 am April 2nd, 2011, outflow was found. It had stopped at around 5:38 pm April 6th, after appropriate counter measure had being taken.

At around noon April 1st, one day before when outflow was found, it was confirmed that air doze rate near inlet canal screen was 1.5mSv/h and increase of doze rate was not observed, and also it was confirmed that no sound of outflow into sea face had been observed from the pit near the crack. Considering these two facts, it is impractical to estimate, as at the time of April 1st, the outflow had already started in a similar manner which was observed during April 2nd to 6th. However, we have no reasonable evidence to estimate when outflow has started, we have conducted our calculation based on the assumption that outflow was started on April 1st.

After outflow was found, we have been monitoring the situation by remote camera and it is detailed in this report

Stoppage work has been implemented from 3 pm April 5th, putting “liquid glass” underneath of trench, and decrease of outflow was observed, however, we have conducted our calculation based on the assumption that outflow has continued as if there were no decrease of outflow due to stoppage work.

Based on above, we estimate the outflow as follows;

- Fall length (height) : 75 cm
- Flying distance : 65 cm
- Diameter of outflow : 30 mm(*)

In addition to above assumptions, we estimate about 4.3 m3/h of water have continuously flown out for 5days, from April 1st to 6th (120 hours), we calculated accumulated volume of outflow will be approximately 520 m3.

(*) By interpreting the photographs and hearing from the workers, we judged the diameter of outflow approximately 30 mm.

2. Concentration of radioactive water

Concentration of radioactive water was analyzed by using sample which was collected at 4:30 pm, April 2nd, inlet water to screen of Unit 2 are as follows;
Concentration of radioactive substance;

Iodine 131	—	5.4×10^6	Beq/cm3
Cesium 134	—	1.8×10^6	Beq/cm3
Cesium 137	—	1.8×10^6	Beq/cm3

3. Estimated total outflow volume

Total volume of outflow;

Iodine 131	—	2.8×10^{15}	Beq
Cesium 134	—	9.4×10^{14}	Beq
Cesium 137	—	9.4×10^{14}	Beq
(Total sum		4.7×10^{15}	Beq)

4. Estimated source of outflow

According to the result of nuclide analysis of outflow water and retained water in the pit, it has turned out the radiation are both in the same level, therefore, we estimate outflow water is same as the retained water in the pit. And as it is confirmed the pit and trench of Unit 2 is structurally connected, we consider the water has flown out from turbine building of Unit 2 through trench into the sea.

5. Countermeasure to prevent diffusion and outflow of radioactive water

(1) Countermeasure to prevent diffusion of radioactive water

In order to prevent diffusion of radio active water, we put steel plate on the screen for inlet canal of Unit 2, where radioactive water has flown out into the sea, put silt fence across the harbor, and put large size 62 sandbags around breakwater south to the screen of Unit 4. In addition to above countermeasure, we put 10 sandbags filled with absorbent of radioactive material, zeolite, in front of each screen room of Unit 1 to 4 for the purpose of absorption of radioactive material and minimize diffusion of radioactive material to offshore. In addition, we plan to consider other countermeasure such as putting steel sheet pile or installing facility which absorb radioactive material around the breakwater south to the screen of Unit 4.

(2) Countermeasure to prevent outflow of radio active water

For the purpose of preventing outflow of radioactive water outside with absolute certainty, we transfer high radiation water into the Centralized Radiation Waste Treatment Facility and is under strict control and storage. And we also implement segregation between trench and turbine buildings. Furthermore, in order to gain steady progress of storage and

treatment of retained water, we implement plans such as installing storage tank to meet each radiation level and water treatment facilities for decontamination and salinity treatment of radioactive water.

(3) Assessment of environmental impact

We will continue to monitor sea water across on and off shore with additional monitoring point and fish and shellfish to follow up the radiation level.

End