Attachment – 4

Installation of circulating cooling system of Spent Fuel Pool of Unit 2 of Fukushima Daiichi NPS (summary)

1. Summary

At Unit 2, Fukushima Daiichi Nuclear Power Station (“Unit 2”), both external and in-house electricity supply were lost due to Tohoku-Chihou-Taiheiyou-Oki Earthquake. As such, the function of Spent Fuel Pool Cooling and Filtering (Clean up) System (“FPC”) was lost.

As a temporary measure, we connected the fire fighting hose to FPC and are supplying freshwater to account for the vaporized water in the Spent Fuel Pool from time to time.

In order to maintain the level of water in the Spent Fuel Pool and ensure that fuels are submerged, there is a need to install a temporary pump and heat exchanger system (“Circulating Cooling System”) to remove the decay heat continuously and lower the volume of vaporization of water in the Spent Fuel Pool.

2. Implementation plan

(1) System

The system is comprised of (i) a system that circulates water in the Spent Fuel Pool through the heat exchanger (“Primary System”) and (ii) a system that releases heat from the Primary System to ambient air by a cooling tower (“Secondary System”). Please refer to attachment 2.

i. Primary System: comprised of a pump, a heat changer, piping, valves, I&C equipments.
ii. Secondary System: comprised of a pump, a cooling tower, a surge tank, valves, I&C equipments. Heat from the Primary System is transferred to the Secondary System by the heat exchanger and released to the ambient air by the cooling tower.

(2) Performance

The evaluation result was, one day and a half after full operation of this Circulating Cooling System, the water temperature of the Spent Fuel Pool will be approx 65 ℃. We are of the opinion that the Circulating Cooling System has sufficient cooling capacity. One month after, the temperature will be approx 41 ℃.

(3) Construction schedule

We are planning to begin the installation work at the site from late May and complete within May.

3. Safety principle

Stable cooling of the Spent Fuel Pool is of high priority in restoring the incident. Safe, steady and swift implementation is the principle.

4. Measures for securing safety

(1) Soundness of the facility

a. durability and quake resistance

In order to protect the facility from aftershocks and maintain the operability and soundness, we will adopt the earthquake-resistant design of at least the same as ordinary industrial facilities.

b. impact by Tsunami

The possibility of Tsunami influencing the Primary System of the Circulating Cooling System is assumed low. We are able to maintain submersion of the spent fuel by resuming intermittent water supply by the fire engine in stand-by at the west side of Main Anti-Earthquake Building.

c. anti-corrosion

As countermeasures for anti corrosion to the Spent Fuel Pool, we are supplying deoxygenized freshwater and injecting chemicals.

(2) Anti leakage

In order to minimize leakage from the Primary System to outside of the system and outdoor, we will implement the following to the Circulating Cooling System:

- We will install drain catcher at the bottom of the heat exchanger
- We will install annuciators and interlock to cope with rupture of piping etc.

(3) Protection from radiation

In order to lower exposure of workers during installation and operators during operation as reasonably achievable, we will implement the following:

- In order to shorten the installation time, to unitize the pump and the heat exchanger.
- Install shields at surrounding areas
- Remote supervision of operating status from the Main Anti-Earthquake Building.

(4) Maintenance of the facility

We will implement operation and maintenance of the facility in order to maintain the long term cooling of the Spent Fuel Pool by the Circulating Cooling System.

a. operation

- To check abnormalities such as leakage
- To check signs of malfunctions and take appropriate measures at an early stage

b. maintenance

- Replace consumables as appropriate

5. duration of operation

By maintaining the facility per above 4 (4), we believe that the facility can be operated continuously.