

Plant Status of Fukushima Daiichi Nuclear Power Station

February 20, 2012

Tokyo Electric Power Company

<1. Status of the Nuclear Reactor and the Primary Containment Vessel> (As of February 20 at 11:00 am)

Unit	Status of Water injection		Bottom temperature of Reactor pressure vessel	Pressure of primary containment vessel	Hydrogen density Of Primary containment vessel
Unit 1	Injecting Fresh water	Core Spray System: Approx. 1.8 m ³ /h	24.0 °C	107.5k Paabs	0.01 vol%
		Feed Water System: Approx. 4.6 m ³ /h			
Unit 2	Injecting Fresh water	Core Spray System: Approx.6.0 m ³ /h	29.9 °C *	113k Paabs	0.08 vol%
		Feed Water System: Approx. 7.7 m ³ /h			
Unit 3	Injecting Fresh water	Core Spray System: Approx. 5.0 m ³ /h	49.5 °C	101.6k Paabs	/
		Feed Water System: Approx. 1.9 m ³ /h			

* We evaluated that the thermocouple previously used (2-3-69H1) was out of order and instead started to use the data measured by other thermocouple (2-3-69H2) from today.

【Unit 2】

- Because the tendency of temperature rise at the bottom of the PCV had been accelerated since February 2 and it continued, we have increased the amount of water injection to the reactor since 2:10 pm on February 12. We confirmed that the meter indicated 82°C exceeding 80°C which is the maximum temperature limit at the bottom of the PCV for the safety operation defined in the safety regulation^{*2} and evaluated that it violated the regulation at 2:20 pm on February 12. In order to satisfy the limit of the safety operation, we increased the amount of water injection. After the countermeasure was taken, the temperature continued to rise and we conducted an investigation of the meter which monitors the temperature at the bottom of the PCV. As a result of the investigation, we evaluated that the thermocouple has been out of order due to disconnection, because the DC resistance was higher than normal level. After the inspection of the soundness of thermocouple, we evaluated that it has been out of order.
- 2:00 pm February 17: We evaluated that the temperature at the bottom of the PCV was not actually risen and it didn't exceed the limit of the safety operation. Our evaluation of violation of the safety operation was corrected retroactive to February 12. The meter was deleted from the list of the meters to monitor the temperature of the bottom of the PVC. The temperature is monitored with the other meters.

*1) Regarding the management of facilities according to Chapter 12 "Mid-term safety securing" of the "Nuclear facility safety protocol", it is required to follow the rules such as "Operational restrictions" and "measures required in cases the facility does not satisfy operational restrictions", in cases the facility does not satisfy the operational restrictions. In this case, in order to implement preservation works, we gradually shifted the operation beyond the operational restrictions [increase of injected water amount into the reactor in any 24 hours shall be less than 1.0m²/h] (from 1:55 pm on February 12), but afterwards we judged that the operational restriction "temperature at the bottom of PCV shall be below 80 °C" was satisfied, and at 2:00 pm on February 17 we corrected the judgment that the operation had gone beyond restrictions. Together we cancelled the scheduled gradual shift beyond operational restrictions.

*2) Reactor Facility Safety Regulation provides necessary conditions such as the numbers of the permitted machines etc. or criteria of temperatures and pressures for securing multiple safety function for operating reactors and for keeping nuclear

power stations stable and these are treated as conditions for operation. When there happen some malfunctions of equipment provided in the regulation and a nuclear power station can not clear the conditions temporarily, operators have to take required countermeasures.

- 12:00 pm on February 19: We started noble gas monitoring of the PCV gas controlling system of Unit 2. (sampling of noble gas)
3:30 pm on February 19: We started continuous monitoring for noble gas by PCV gas controlling system of Unit2.
- 6: 40 pm on February 19: As we have started to monitor continuously the noble gas through the gas control system of the Primary Containment Vessel for the water injection into the reactor of the Unit 2, of which flow rate increased due to the increase of the water temperature indicator, we changed the injection amount through the core spray system from approx. 10.0 m³/h to approx. 6.0 m³/h (the injection amount through the feed water system is kept at approx. 7.6 m³/h)

【Unit 4】【Unit 5】【Unit 6】

- No significant incidents have happened.

<2. Status of the Spent Fuel Pool> (As of February 20 at 11:00 am)

Unit	Cooling type	Status of cooling	Temperature of water in Spent Fuel Pool
<u>Unit 1</u>	Circulating Cooling System	Under operation*	25.0 °C
<u>Unit 2</u>	Circulating Cooling System	Under operation	12.5 °C
<u>Unit 3</u>	Circulating Cooling System	Under operation	13.1 °C
<u>Unit 4</u>	Circulating Cooling System	Under operation	22.0 °C

* System secondary air fin cooler: out of service

【Unit 2】

- Desalination equipment has been activated in order to reduce density of salt from the spent fuel pool since 11:50 am on January 19.
- At around 5:00 am on February 8, the alarm of “abnormally low suction pressure of the high pressure RO pump” in the desalination apparatus for the Unit 2 spent fuel pool went off, and its operation was automatically stopped. The interlock arrangement closed all the isolation valves in the system. The alternative cooling system for the spent fuel pool continues its operation. Therefore, there is no impact on the cooling. We also confirmed by the site investigation that there was no leakage from the apparatus.
- From 3:20 pm on February 18, based on the result of the site survey, it was estimated that the operation stop was caused by the instantaneous pressure drop (pressure pulsation). The system was reactivated after implementing the countermeasure.
- At 7:05 pm on February 18, within the Unit 2 SFP alternative cooling system, an alarm sounded showing that the water flow difference was large at the gateway of primary system pump and the system automatically shutdown. Due to this the desalting facility has also shut down.
- At 11:54 pm on February 18, In order to protect the facility from freezing due to fall of temperature, we activated the substitutive cooling system.
- At 10:44 am on February 19, we reactivated the desalting facility.
- From 1:46 pm to 2:38 pm on February 20, we presumed the cause is stuck of dust in the pipe of flow sensor of the alternative cooling system and therefore conducted flashing of pipes.

【Unit 3】

- Radioactive material removal equipment has been activated in order to remove radioactive materials from the spent fuel pool since 3:18 pm on January 14.

<3. Status of water transfer from the Vertical Shaft of the Trench and the basement floor of the Turbine Building>

Unit	Draining water source	→	Place transferred	Status
Unit 2	Unit 2 T/B	→	Central Radioactive Waste Treatment Facility [Miscellaneous Solid Waste Volume Reduction Treatment Building(High Temperature Incinerator Building)]	2:43 pm on February 10 – 9:17 am on February 20 Transferred 9:39 am on February 20 – Transferring
Unit 3	Unit 3 T/B	→	Central Radioactive Waste Treatment Facility [Miscellaneous Solid Waste Volume Reduction Treatment Building(High Temperature Incinerator Building)]	9:30 am on February 20 - Transferring
Unit 6	Unit 6 T/B	→	Temporary tank	From 10:00 am to 4:00 pm on February 20 Transferred

- From 10:11 am – 5:11 pm, we started to transfer the accumulated water from circulating water pump discharge valve pit to the basement of Unit 2 Turbine Building.

<4. Status of the Treatment Facility and the Storage Facility> (As of February 20 at 7:00 am)

Facility	Cesium adsorption apparatus	Secondary Cesium adsorption apparatus (sarry)	Decontamination instruments	water desalinations (reverse osmosis membrane)	water desalinations (evaporative concentration)
Operating status	Under operation	Under operation*	Out of service	Operating intermittently according to the water balance	Operating intermittently according to the water balance

*Cleaning of filter is implemented accordingly.

- June 8, 2011~ Large tanks to store contaminated and decontaminated water are transported and installed.

<5. Others>

- October 7, 2011~: Continuously implementing water spray using water after purifying accumulated water of Unit 5 and Unit 6 to prevent spontaneous fire of trimmed trees and diffusion of dust.
- February 20, 2012: at 3:43 pm, we found that an error message was displayed on the monitor for the noble gas (B system) of the gas control system of the Unit 2 Primary Containment Vessel and then could not check some of the parameters in the B system in the Main Anti-Earthquake Building. The system has 2 systems of monitoring and therefore currently we are using the A system and able to monitor continuously. We have been investigating the cause of the malfunction of the B system.