Records after August 1, 2011

※ As of 9:00 am on October 10, 2011

Fukushima Daiichi Nuclear Power Station

' **Units 1 to 3: Shutdown due to the earthquake**
(Units 4 to 6: Outage due to regular inspections)

- The national government has declared the area within 20km radius of the site as a "no-go zone" and between 20km and 30km radius of the site as a "stay-indoors zone."
- At 12:09 pm on August 4, we stopped the operation of diesel generator (5B) manually due to automatic start of the generator caused by an error signal related to the rector water level during the connect test of power supply associated with enhancement of instrument power .For reference, this event did not affect the power system.
- At approx. 12:50 pm on August 4, electricity went out at Main Anti-Earthquake Building. At around 12:51 pm on the same day, its power supply was restored due to start-up of emergency gas turbine generator. The cause of this power outage is currently under investigation. For reference, this event did not affect the plant status and we continue injecting water and nitrogen gas to the reactor.
- At approx. 3:00 pm on August 11, we confirmed that the circuit breaker supplying power to the charger for control power of the temporary power board for Units 1 and 2 was open. At 4:00 pm on the same day, we confirmed that the voltage of the back-up battery for control power dropped. At 1:21 am on August 12, we replaced the battery and the charger and resumed receiving power.
- At approx. 3:22 am on August, 12, an M 6.0 earthquake with the seismic center at offshore of Fukushima prefecture occurred. Events confirmed are as follows:
  - The boiler for the evaporative concentration apparatus at the water treatment facility stopped. At 3:42 am on the same day, we restarted the boiler and resumed vaporization and condensation.
  - At 3:52 am on the same day, we confirmed that the reactor water injection rate for Unit 1 dropped to 3.2m^3/h. At 3:52 am on the same day, we adjusted the rate to 3.9m^3/h. Reactor water injection for Units 1 to 3 is continuing.
  - At 5:06 am on the same day, we confirmed that one out of two of the temporary control air compressor, Unit 1 stopped. As we could not restart this, at 6:44 am on the same day, we started the back-up diesel-driven air compressor. There is no impact on the nitrogen gas injection for Unit 1.
  - At 5:27 am on the same day, we found very small volume of water leakage from a hose, primary system, alternative Spent Fuel Pool cooling system located in the rad waste treatment building, Unit 4. We are planning to replace the hose.
- At approx. 2:46 pm on August 19, an M6.8 earthquake with the seismic center at offshore of Fukushima prefecture occurred. Events confirmed are as follows:
  - There were no abnormalities on the major parameter for each unit.
  - There were no abnormalities on the outside power supply, water injection into reactors, Nitrogen injection into the reactors and cooling water of the spent fuel pools.
- At approx. 11:30 am on August 25, we found that oil piping for cooling main transformer is damaged and blowing out of contained insulation oil, during the removal work of debris near main transformer of unit 3. At 6:10 pm on the same day, we confirmed the oil leakage from the oil pipeline stopped
- At around 3:00 pm on October 3, TEPCO staff observed an oil leakage from the transformer B system for transportation of Okuma 3 line (in-vehicle) while on patrol. The amount of the oil leakage was about one drop in ten seconds and the oil formed an oil film of approximately 1m x 1m. An emergency procedure was taken to stop the leakage. A further investigation will be conducted, though the transformer can be used without problems.
- At 5:07 pm, to install a gas controlling system of RPV, Unit 1, we started cutting a pipe in the RPV spray after we confirmed the hydrogen density was low enough. At 10:30 pm on the same day, the cutting finished.

【Unit 1】

<Water injection to the reactor>

- From 5:55 pm to 5:56 pm on August 1, we changed the volume of water injected into the reactor of Unit 1 and Unit 2 to approx. 3.9m^3 / h.
- At 9:02 am on August 5, decrease of water injection volume to Unit 1 reactor was confirmed and it was adjusted to approx. 3.9 m^3/h.
- At 8:32 am on August 10, we adjusted flow rate of injecting water at approx. 3.8m^3/h due to the decrease of injected water to reactors
- At 12:20 pm on August 10, we adjusted flow rate of injecting water at approx. 3.8m^3/h due to the increase of injected water in reactor.
- At approx. 3:22 am on August 12, an M 6.0 earthquake with the seismic center at offshore of Fukushima prefecture occurred. At 3:52 am on the same day, we confirmed that the reactor water injection rate for Unit 1 dropped to 3.2m^3/h. At 3:52 am on the same day, we adjusted the rate to 3.9m^3/h.
- At 7:36 pm on August 13, we adjusted the rate of water injection to Unit 1 reactor to approximately 3.8m^3/h as we confirmed decrease in the amount of water injection.
- At 3:20 pm on September 1, as it was confirmed that there was a decrease in the amount of water injection for the reactor of Unit 1, we adjusted the rate to approx. 3.8 m^3/h.
- At 9:40 am on September 3, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 3.8m^3/h.
- At 2:53 pm on September 7, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 3.8m^3/h.
- At 5:40 pm on September 11, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 3.8m^3/h.
- At 6:07 pm on September 13, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 3.8m^3/h.
- At 3:41 pm on September 16, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 3.8m^3/h.
- At 11:40 am on September 21, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 3.8m^3/h.
- At 10:25 am on September 28, we switched water injection line to emergency line at Unit 1,2 and 3 for the trial run of mini flow line in the regular injection line set on the hill. At 2:02 pm on the same day, we switched back to the regular water injection line after the trial run. There was no change in the injection amount due to this work
- At 9:28 am on October 6, we arranged the amount of water injected to the reactor to 3.8 m^3/h since we found the reduction in the amount of injected water.

<Water spray to Spent Fuel Pool>

- At 3:20 pm on August 5, we started freshwater injection into the spent fuel pool of Unit 1 through Spent Fuel Pool Cooling and Filtering System, and finished at 5:51 pm.
- At 8:59 am on August 10, we started injecting fresh water to Spent Fuel Pool using Fuel Pool Cooling and Filtering System. At 9:19 am on same day, we finished injecting water.

<Treatment of the Accumulating Water>

- At 9:53 am on September 14, we stared transfer of the accumulated water from the condenser to the basement of Turbine Building of Unit 1. At 2:35 pm on September 16, we stopped transfer.

<Alternative Cooling of Spent Fuel Pool>

- From 10:06 am to 11:15 am on August 10, we started cyclic cooling of Spent Fuel

Pool of Unit 1 by using alternative cooling system of the Pool's cooling and filtering system. And at 11:22 on same day, we started full-scale operation.

< Injection of nitrogen gas into Primary Containment Vessel >

- From 5:52 am on August 2, in order to replace the nitrogen gas injector device, we stopped nitrogen gas injection into the Primary Containment Vessels of Units 1 to 3. After completion of the replacement, we restarted injection of nitrogen gas at 8:33 am,

<Others>

- At 3:22 am on August 12, an M 6.0 earthquake with the seismic center at offshore of Fukushima prefecture occurred. We confirmed that one out of two of the temporary control air compressor, Unit 1 stopped. As we could not restart this, at 6:44 am on the same day, we started the back-up diesel-driven air compressor. There is no impact on the nitrogen gas injection for Unit 1.
- From 8:10 am to 2:25 pm on August 28, we conducted dust sampling at the upper part of reactor building of Unit 3 using a large crane vehicle.
- From 9:45 am to 1:30 pm on September 11, we conducted dust sampling at the upper part of reactor building of Unit 1 using a large crane vehicle.
- From 9:15 am to 0:10 pm on September 14, we sampled gases in the Reactor Pressure Vessel of Reactor Building, Unit 1
- From 8:55 am to 12:05 pm on October 3, dust sampling of upper parts of Unit 1 reactor building was conducted using a large-scale crane.
- From 11:44 am to 2:03 pm on October 7, we conducted dust sampling at Opening section for equipment hatch and truck bay door of Unit 1 Reactor building.

【Unit 2】

<Water injection to the reactor>

- From 5:55 pm to 5:56 on August 1, we changed the rate of water injection into the reactor of Unit 1 and Unit 2 to approx. 3.9m^3 / h.
- At 5:50 pm on August 4, decrease in the rate off water injection into Unit 2 reactor was confirmed and it was adjusted to approx. 3.8m^3/h.
- At 8:32 am on August 10, we adjusted flow rate of injecting water at approx. 3.8m^3/h due to the decrease in the rate of water injection to reactor.
- At 12:20 pm on August 10, we adjusted the rate of injecting water at approx. 3.8m^3/h due to the increase in the rate of injecting water to reactor.
- At 7:30 pm on August 12, we adjusted the rate of injecting water at approx. 3.8m^3/h, as we confirmed the increase in the rate of injecting water to reactor.
- At 9:48 pm on August 15, we adjusted the rate of injecting water at approx. 3.8m^3/h as we confirmed the decrease in the rate of injecting water to reactor.
- At 3:46 pm on August 17, we adjusted the rate of injecting water to the reactor at approx. 3.8m^3/h, as we confirmed the decrease in the rate of water injection.
- At 3:30 pm on August 19, we adjusted the rate of injecting water to the reactor at approx. 3.8m^3/h, as we confirmed decrease in it.
- At 6:56 pm on August 30, we adjusted the rate of injecting water to the reactor at approx. 3.8m^3/h, as we confirmed decrease in it.
- At 7:17 am on September 2, as it was confirmed that there was a decrease in the amount of water injection for the reactor of Unit 2, we adjusted the rate to approx. 3.8 m^3/h
- At 9:40 am on September 3, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 3.8m^3/h.
- At 4:27 pm on September 6, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 3.8m^3/h.
- At 2:55 pm on September 7, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approximately 3.8m^3/h.
- At 10:33 pm on September 8, as it was confirmed that there was a decrease in the

amount of water injection for the reactor, we adjusted the rate of water injection to approximately 3.8m^3/h.

- At 5:40 pm on September 11, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approximately 3.8m^3/h.
- At 6:07 pm on September 13, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approximately 3.8m^3/h.
- At 2:59 pm on September 14, we will start injecting water into the Reactor of Unit 2 through the core spray system. At 3:25 pm on the same day, we adjusted the volume water at 1.0 m3/h. The volume of water injected from the feed water system remains unchanged
- At 3:45 pm on September 15, with regard to the injection into the reactor of Unit 2, we adjusted the amount of water injection from the core spray system to approx. 2.0 m^3/h (the amount from the feeding water system is kept at approx. 3.8 m^3/h)
- At 9:11 am on September 16, as it was confirmed that there was a decrease in the amount of water injection for the reactor, we adjusted the rate of water injection to approx. 2.0m^3/h.
- At 3:35 pm on September 16, with regard to the injection into the reactor of Unit 2, we adjusted the amount of water injection through the core spray system to approx. 3.0m^3/h (injection through feed water system remain at 3.8m^3/h).
- At 3:16 pm on September 19, we adjusted water injection amount from Core Spray System to the reactor of Unit 2 to approx. 4.0 m3/h. (Water injection amount from Reactor Feed Water System remains approximately. 3.8 m3/h.)
- At 11:40 am on September 21, as it was confirmed that water injection to Unit 2 reactor by reactor water feed system was decreased. We adjusted the amount of water injection to approximately 4.0 m3/h. The amount of water injection by reactor core spray system was also adjusted to approximately 4.0 m3/h.
- At 3:36 pm on September 22, we adjusted the volume of water injected at 5.0 m3/h from Core Spray System into Reactor Building of Unit 2 (while we continue injecting water at of 4.0 m3/h from Feed Water System).
- At 3:05 pm on September 26, we adjusted the volume of water injected at 6.0 m3/h from Core Spray System into Reactor Building of Unit 2 (while we continue injecting water at of 4.0 m3/h from Feed Water System).
- At 10:25 am on September 28, we switched water injection line to emergency line at Unit 1,2 and 3 for the trial run of mini flow line in the regular injection line set on the hill. At 2:02 pm on the same day, we switched back to the regular water injection line after the trial run. There was no change in the injection amount due to this work.
- At 3:00 pm on October 4, we adjusted water injection rate into Unit 2 through reactor spraying system at approx. 7.0 m^3/h (injection rate through feed water system remains at approx. 4.0 m^3/h).
- At 5:38 pm on October 6, we adjusted water injection rate through reactor feed water system at 3.8 m^3/h, since we observed decrease in water injection. (Injection rate through core spray system remains at approx. 7.0 m^3/h.)

< Draining water from the underground floor of the turbine building >

- At 4:10 pm on July 30, we started transferring accumulated water at Unit 2 turbine building to Centralized Radiation Waste Treatment Facility. We stopped transfer at 6:49, August 2.
- At 7:09 am on August 4, we started transferring accumulated water from the vertical shaft of Unit 2 to Centralized Radiation Waste Treatment Facility (Process Main Building). At 4:56 pm on August 9, we stopped the transfer.
- At 4:47 pm on August 10, we started transferring the accumulated water from the vertical shaft of Unit2 Turbine Building to Centralized Radiation Waste Treatment Facility (Process Main Building). At 11:43 am on August 16, we stopped transfer.
- At 4:19 pm on August 18, we started transferring the accumulated water from the vertical shaft of Unit2 Turbine Building to Centralized Radiation Waste Treatment Facility (Process Main Building).
- At 10:03 am on August 25, we stopped transferring accumulated water from vertical

shaft of Unit 2 Turbine Building to the Centralized Waste Treatment Facility (Process Main Building), and started transferring to Centralized Waste Treatment Facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]).

- At 9:31 am, August 30, we stopped transfer of accumulated water from the vertical shaft of turbine building of unit 2 to Centralized Radiation Waste Treatment Facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]) and started transfer of accumulated water to Centralized Radiation Waste Treatment Facility (Process Main Building) at 9:39 am.
- At 10:11 am on September 6, as it was confirmed that there was a decrease of draining water level at the basement of Unit 2 turbine building, we started transferring accumulated water at Unit 2 condenser to the basement of Unit 2 turbine building. At 2:54 pm on the same day, we stopped transiting.
- At 10:00 am on September 7, we started transferring accumulated water at Unit 2 condenser to the basement of Unit 2 turbine building. At 4:07 pm on the same day, we stopped transfer.
- At 9:35 am on September 13, we stopped transferring accumulated water at Unit 2 turbine building vertical shaft to Centralized Radiation Waste Treatment Facility (Process Main Building), and at 9:51 am, we started transferring accumulated water to Centralized Radiation Waste Treatment Facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]).
- To change transfer route of accumulated water of Unit 2, at 1:16 pm on October 4, we stopped transfer of accumulated water from vertical shaft of turbine building of Unit 2 to centralized radiation waste treatment facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]). At 1:48 pm on October 6, we started to transfer accumulated water from underground floor of turbine building of Unit 2 to centralized radiation waste treatment facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]).

＜Alternative Cooling of Spent Fuel Pool＞

- At 10:03 am on September 6, we stopped the operation of Spent Fuel Pool Cooling and Filtering System of Unit 2 due to cleaning the cooling tower in the second order of circulating cooling system in the spent fuel pool for Unit 2. At 10:42 am on the same day, we resumed its operation.

<Injection of nitrogen gas into Primary Containment Vessel>

- From 5:52 am on August 2, in order to replace the nitrogen gas injector device, we stopped nitrogen gas injection into the Primary Containment Vessel of Units 1 to 3. After completion of the replacement, we restarted injection of nitrogen gas at 8:29 am. We continued injection of nitrogen gas with a backup injector from 5:58 am to 8:27 am.
- At 12:30 pm on October 6, we arranged the amount of nitrogen injected to the reactor containment vessel of Unit 2 to 13.5 m^3/h because we found the increase in amount of injected nitrogen.

<Others>

- From 10:39 am to 11:13 am on August 9, we conducted sampling of gas in the Primary Containment Vessel of Unit 2.
- At 10:35 am on August 24, we started injection of hydrazine to spent fuel pool of Unit 2 through the circulating cooling system. At 12:29 pm on the same day, we stopped injection of hydrazine. (Hydrazine is injected as appropriate.)
- From 10:35 am to 1:20 pm on August 29, we conducted sampling of dust at the openings (blow out panel), Reactor Building, Unit 2.
- From 10:05 am to 11:05 am and from 2:43 pm to 3:43 pm on September 17, we conducted sampling of dusts at the openings (blow out panel), Reactor Building, Unit 2.
- From 9:26 am to 10:26 am on October 5, we conducted sampling of dusts at the

openings (blow out panel), Reactor Building.

【Unit 3】

<Water injection to the reactor>

- At 7:19 am on August 7, as we observed increase in the rate of water injection to reactor on unit 3, we adjusted water injection rate to approx. 9.0m^3/h.
- At 4:22 pm on August 10, as we observed fluctuation of reactor water injection rate, we adjusted the rate to approx 9.1m^3/h.
- At 7:30 pm on August 12, we adjusted the rate of injecting water at approx. 9.0m^3/h, as we confirmed the increase in the rate of injecting water to reactor.
- At 12:20 pm on August 18, we added and replaced flow regulating valves of water injection line of Unit 3. At 12:27 pm on the same day, we adjusted the rate of water injection into the reactor at approx. 8.0m^3/h.
- At 1:00 pm on August 20, we adjusted the rate of water injection into the reactor at approx. 7.0m^3/h.
- At 2:09 pm on September 1, in order to restart injecting water to the reactor of unit 3 by core spray system in addition to feeding line, we started to adjust flow rate of injection. At 2:58 pm on the same day, we adjusted flow rate at approx.7.0m^3/h for injecting from feeding line and at 1.0 m^3/h for injecting from core spray system.
- At 2:50 pm on September 2, we adjusted flow rate at approx.7.0m^3/h for injecting from feeding line and at 2.0m^3/h for injecting from core spray system.
- At 2:37 pm on September 3, we adjusted the rate of water injection at approx. 7 m^3/h through reactor feed water system piping arrangement, and at approx. 3 m^3/h through core spray system.
- At 2:43 pm on September 5, we adjusted the rate of water injection through reactor feed water system piping arrangement to approx. 6.0 m3/h. (Water injection through core spray system continues at approx. 3.0 m3/h.)
- At 2:46 pm on September 7, we adjusted the rate of water injection for the reactor through reactor feed water system piping arrangement to approx. 5.0 m3/h. (Water injection through core spray system continues at approx. 3.0 m3/h.)
- At 2:01 pm on September 12, we adjusted the rate of water injection for the reactor through reactor feed water system piping arrangement to approx. 4.0 m3/h. (Water injection through core spray system continues at approx. 3.0 m3/h.)
- From 10:16 am to 2:15 pm on September 16, at increasing volume of water injecting into the reactor of Unit 3, we conducted injection of boric acid into the reactor. Thereafter, we increased injection rate of water through core spray system and at 3:05 pm adjusted at 8.0m3/h (injection rate from feed water system remain at 4.0m^3/h).
- At 3:17 pm on September 22, we adjusted the volume of water injected at 3.0 m3/h from Feed Water System into Reactor Building of Unit 3 (while we continue injecting water at 8.0 m3/h from Core Spray System).
- At 10:25 am on September 28, we switched water injection line to emergency line at Unit 1,2 and 3 for the trial run of mini flow line in the regular injection line set on the hill. At 2:02 pm on the same day, we switched back to the regular water injection line after the trial run. There was no change in the injection amount due to this work

<Spent Fuel Pool alternative cooling>

- At 3 pm on September 30, in order to add transformer control panel as power supply for works related Unit 3, the power supply for Spent Fuel Pool Cooling was temporary stopped. At 7:26 pm, the power was restored and the cooling was resumed.

< Draining water from the underground floor of the turbine building >

- At 4:13 pm on July 30, we started transferring accumulated water at Unit 3 turbine building to Centralized Radiation Waste Treatment Facility. At 7:17 am on August 4, we stopped the transfer.
- At 8:42 am on August 5, we started transferring accumulated water from the basement of Unit 3 turbine building to Centralized Radiation Waste Treatment

Facility (Process Main Building). At 4:46 pm on August 15, we stopped the transfer.

- At 8:51 am on August 19, we started transferring accumulated water from the basement of Unit 3 turbine building to Centralized Radiation Waste Treatment Facility (Process Main Building). At 9:28 am on August 21, we stopped the transfer.
- At 9:39 am on August 21, we started transferring accumulated water from the basement of the turbine building of Unit 3 to Miscellaneous Solid Waste Volume Reduction Treatment Building (High temperature incinerator facility). In addition, at 4:15 pm on August 23, we started transferring accumulated water from the basement of the turbine building of Unit 3 to Centralized Radiation Waste Treatment Facility (Process Main Building). At 9:30 am on August 24, we stopped transferring accumulated water from the basement of the turbine building of Unit 3 to Miscellaneous Solid Waste Volume Reduction Treatment Building (High Temperature Incinerator Building). We continue to transfer to the Process Main Building.
- At 9:46 am, August 30, we stopped transfer of accumulated water from the basement of turbine building of unit 3 to Centralized Radiation Waste Treatment Facility (Process Main Building) and at 9:54 am, we started transfer of accumulated water to Centralized Radiation Waste Treatment Facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]).
- At 9:11 am on September 8, we stopped transferring accumulated water from the basement, T/B to Misc Solid Waste Volume Reduction Building [High Temperature Incinerator Building], Centralized Radiation Waste Treatment Facility. From 9:30 am, we started transferring accumulated water to Process Main Building, Centralized Radiation Waste Treatment Facility.
- At 9:35 am on September 11, we stopped transferring accumulated water from the basement of turbine building of Unit 3 to Centralized Radiation Waste Treatment Facility (Process Main Building). At 10:00 am, we started transferring the accumulated water to Centralized Radiation Waste Treatment Facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]).
- At 9:44 am on September 15, we stopped transfer of the accumulated water from the basement of the turbine building of Unit 3 to Centralized Radiation Waste Treatment Facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]), and restarted transfer to Centralized Radiation Waste Treatment Facility (Process Main Building).
- At 9:46 am on September 30, we stopped transferring accumulated water from Unit 3 turbine building basement to Centralized Radiation Waste Treatment Facility (Process Main Building). At 10 am on the same day, we resumed the transfer to Centralized Radiation Waste Treatment Facility (Miscellaneous Solid Waste Volume Reduction Treatment Building [High Temperature Incinerator Building]).
- At 10:59 am on October 3, we started transferring accumulated water at the Unit 3 condenser to the basement of the turbine building. It was stopped at 10:22 am on October 9.

<Nitrogen Injection into the Primary Containment Vessel>

- From 5:52 am on August 3, in order to replace the nitrogen gas injector device, we stopped nitrogen gas injection into the Primary Containment Vessel of Units 1 to 3. After completion of the replacement, we restarted injection of nitrogen gas at 8:29 am.

<Others>

- From 9:00 am to 12:35 pm on August 24, we conducted dust sampling at the upper part of reactor building of Unit 3 using a large crane vehicle.
- From 8:05 am to 9:35 am on September 12, we conducted dust sampling at the upper part of reactor building of Unit 3 using a large crane vehicle.
- From 2:13 pm to 3:47 pm on October 6, we conducted dust sampling at the upper part of reactor building of Unit 3 using a large crane vehicle.

【Unit 4】

<Alternative cooling of spent fuel pool>

- At approximately 11:20 am on August 11, as we found a little water leakage in the primary hose of the circulating cooling equipment for the spent fuel pool in the centralized radiation waste treatment facility of Unit 4, we covered and reinforced the leakage part with plastic. We are planning to replace the hose, etc. We have been continuing circulating cooling of the spent fuel pool.
- At 3:22 am on August 12, an M 6.0 earthquake with the seismic center at offshore of Fukushima prefecture occurred. At 5:27 am on the same day, we found very small volume of water leakage from a hose, primary system, alternative Spent Fuel Pool cooling system located in the rad waste treatment building, Unit 4. We are planning to replace the hose.
- As a countermeasure against slight water leakage from the primary hose of the alternative cooling apparatus for the spent fuel pool, we stopped the alternative cooling apparatus in order to exchange the hose at 7:58 pm on August 17. At 3:00 pm on the same day, we resumed operation of the system.
- At approximately 12:30 pm August 23, small amounts of water was found leaking from a flexible hose connected to the primary system of the alternative cooling and filtering system of the Spent Fuel Pool at the Waste Treatment Building of Unit 4. Actions to repair the leakage point were taken and alternative cooling for the Spent Fuel Pool conducted continuously.
- Around 1:00 pm on September 21, small amounts of water was found leaking from a flexible hose connected to the primary system of the alternative cooling and filtering system of the Spent Fuel Pool at the Waste Treatment Building of Unit 4. Actions to repair the leakage point were taken and alternative cooling for the Spent Fuel Pool is being conducted continuously.

<Desalting water in Spent Fuel Pool>

- As we confirmed that there was no problem with the desalting facility for the spent fuel pool of Unit 4 through a trial operation at 10:24 am on August 20, at 11:34 am on the same day we started to operate it fully.
- At 10:34 am on August 22, a water-level alarm of condensed waste tanks was generated and the desalination facility stopped. After confirming no leakage, we restarted its service at 6:25 pm on the same day.
- At 9:47 am on September 14, we stopped the Spent Fuel Pool’s desalination system of Unit 4 to install an electric dialysis equipment. At 0:25 pm on the same day, the desalination system resumed while we continued operation of an alternative system to cool down the pool.
- At 8:54 am on October 3, the secondary cooling system piping arrangement of circulating cooling system of Unit 4 spent fuel pool was stopped due to the replacement of the secondary cooling system piping arrangement. After completing the replacement, the secondary cooling system was restarted at 3:03 pm on the same day.

【Unit 5】

<Treating accumulated water>

- From 2:06 pm on October 7, in order to prevent from spontaneous combustion of cut trees and dust dispersing we started to sprinkle water in the site of Fukushima Daiichi Nuclear Power Station with cleared-up accumulated water of Unit 5 and 6. We measured radioactivity density in advance and confirmed to meet requirement of the guideline suggested in “Guideline regarding radioactive materials on bathing area”.

<Others>

- From 10:03 am to 10:43 am on August 8, we stopped the residual heat removal system pump (D) in order to switch the power source of the pump (C) as well as conducting its commissioning (C)
- In order to repair the outlet valve of Unit 5 residual heat removal system seawater

pump (D), from 9:45 am to 10:42 am, September 26, we switched the seawater pump from B system (permanently installed) to A system (temporarily installed).

- On September 30, as the repair work for the outlet valve of Unit 5 Residual Heat Removal System Sea Water Pump completed, between 11:30 am and 11:34 am on the same day, the Residual Heat Removal System was switched from A system to B (the Residual Heat Removal System Sea Water Line was also switched from A system to B).

【Unit 6】

< Draining water from the underground floor of the turbine building >

- Following start of transferring of low radioactive accumulated water from temporary tank to Mega Float, we restarted the transferring of accumulated water at the underground of Unit 6 turbine building to temporary tank, as shown below.

From 11:00 am to 4:00 pm on August 2
From 11:00 am to 4:00 pm on August 3
From 11:00 am to 4:00 pm on August 5
From 11:00 am to 4:00 pm on August 6
From 11:00 am to 4:00 pm on August 8
From 11:00 am on August 9 to 5:00 pm on August 10
From 10:00 am to 4:00 pm on August 11
From 10:00 am to 4:00 pm on August 12
From 11:00 am on August 15 to 9:00 am on August 16
From 10:00 am to 5:00 pm on August 18
From 10:00 am to 1:00 pm on August 19
From 10:00 am on August 23 to 4:00 pm on August 24
From 10:00 am to 4:00 pm on August 25
From 10:00 am to 4:00 pm on August 26
From 10:00 am to 4:00 pm on August 29
From 10:00 am to 4:00 pm on September 1
From 11:30 am to 4:00 pm on September 12
From 10:00 am to 4:00 pm on September 13
From 10:00 am to 4:00 pm on September 15
From 10:00 am to 4:00 pm on September 20
From 10:00 am to 4:00 pm on September 21
From 10:00 am to 4:00 pm on September 22
From 10:00 am to 4:00 pm on September 24
From 10:00 am to 4:00 pm on September 26
From 10:00 am to 4:00 pm on September 28
From 10:00 am to 4:00 pm on September 29
From 10:00 am to 4:00 pm on September 30
From 10:00 am to 4:00 pm on October 3
From 10:00 am to 4:00 pm on October 5
From 10:00 am to 4:00 pm on October 7

- We transferred low level radioactive accumulated water, which had been transferred from the turbine building to the temporary tank, from the temporary tank to Mega Float, as shown below.

From 10:00 am to 5:00 pm on August 2
From 10:00 am to 5:00 pm on August 3
From 10:00 am to 5:00 pm on August 5
From 10:00 am to 5:00 pm on August 6
From 10:00 am to 5:00 pm on August 8

- We transferred accumulated water from the basement of Unit 6 reactor building to the turbine building as shown below.

From 11:05 am to 12:00 pm on September 2
From 8:30 am to 9:55 pm on September 3
From 1:20 pm to 2:45 pm on September 8
From 10:15 am to 11:30 am on September 12

Transfer from September 13 onwards, will be considered depending on the water level at the building.

- At 10:00 am on August 9, we resumed transferring low-level accumulated water to Mega Float from a temporary tank where we had transferred from the turbine building of Unit 6. At 10:12 am the transfer was suspended, as we confirmed accumulated water was leaking from the transfer hose. At 1:35 pm on the same day, we restarted the transfer after replacing the hose. At 5:00 pm on the same day, we completed the transfer. After that, the results of the transfer are shown below.

  From 5:00 pm on August 13 to 10:00 am on August 14
- From 2:06 pm on October 7, in order to prevent from spontaneous combustion of cut trees and dust dispersing we started to sprinkle water in the site of Fukushima Daiichi Nuclear Power Station with cleared-up accumulated water of Unit 5 and 6. We measured radioactivity density in advance and confirmed to meet requirement of the guideline suggested in “Guideline regarding radioactive materials on bathing area”.

<Others>

- At 9:27 am on August 9, as we conducted plumbing connection work to Unit 6 residual heat removal seawater system (System A), we stopped the power source of residual heat removal seawater system (System B) and cooling of the reactor and the spent fuel pool was temporarily suspended. At 2:01 pm on the same day, we completed the work and restarted cooling the reactor and the spent fuel pool by the residual heat removal seawater system (System B).
- From 9:55 am to 12:39 pm on September 8, in order to fill Residual Heat Removal System seawater system cooling pump (A) of Unit 6, we stopped Residual Heat Removal System (B). With this, cooling of Reactor and Spent Fuel Pool were also temporarily suspended
- At 2:29 pm on September 10, we stopped the residual heat removal system (B) of Unit 6. At 3:12 pm we started (A) of the same system. (Cooling of the spent fuel pool was temporarily suspended, however, there was no change in the water temperature in the pool before and after the suspension.) The water in the reactor and in the spent fuel pool will be alternately cooled by the residual heat removal system (A).
- At 9:56 am on September 15, we restored and restarted the seawater pump of Equipment Cooling Water System of Unit 6. At 2:33 pm on the same day, we completed the adjustment of the flow rate of Fuel Pool Cooling System and started cooling the spent fuel pool. Consequently, the reactor and the spent fuel pool are now separately cooled through Residual Heat Removal System and Fuel Pool Cooling System respectively.
- At 11:05 am on September 27, on the second floor of the turbine building of Unit 5, while draining lubricant oil of overhead crane to drums for inspection of the crane, one of our employees found lubricant oil was leaked on the floor. The amount of the leaked oil was approximately 8 liters, and at about 1:00 pm, we wiped the oil from the floor.
- Because a decrease in the amount of water was confirmed at the residual heat removal system seawater pump (C), the cooling of the reactor using residual heat removal system (A) was stopped at 11:20 am on October 3, and we implemented the inspection of the residual heat removal system seawater pump (C) and the related system. The inspection result confirmed its normal function. Thus, at 12:44 pm on the same day, we resumed cooling the reactor by residual heat removal system (A).
- At 1:41 pm October 6, We stopped pumping at auxiliary cooling seawater system Unit 6 since we found slow decreasing trend in pressure of pump header at that system. At 2:07 pm October 6, we restarted the pump and confirmed that the pressure was normal value.
- As confirming downward tendency on flow rate at Residual Heat Removal system sea water pump (C) of Unit 6, we stopped cooling reactor by Residual Heat Removing system (A) and conducted check-out the pump and related system at 11:55 am on October 7. The result of check-out , we confirmed no abnormalities

and restarted cooling reactor with Residual Heat Removal system (A) at 12:41 pm on the same day.

【Others】

<Detection of radioactive materials>

[Soil]

- Plutonium was detected in the soil sampled on August 1, 8, 15, September 5, 12 and 19 in the site of the Power Station. In addition, as a result of nuclide analysis of the gamma ray contained in the soil, radioactive materials were detected.

  Strontium 89 and 90 were detected as a result of analysis conducted on strontium contained in the soil sampled on August 15 and September 12 in the site of the Power Station.

[Air]

- We detected radioactive materials in the air collected at the site of Fukushima Daiichi Nuclear Power Station on August 2, 3, 4, 6, 8 to 10, 12, 14, 15, 17, 18, 21, 23, 25, 31 and September 1, 5, 7, 8, 9, 10, 12, 13, 14, 15 ,21, 22, 24, 25, 27, 28 ,29, 30, October 3 and 7. The data of three detected nuclides (Iodine-131, Cesium-134 and Cesium-137) were reported as fixed data. The valuation results of other nuclides were published based on the improved methods for recurrence prevention prepared in accordance to the strong warning by NISA on April 1.
- At 2:30 pm on August 18, we confirmed the instrument reading of transportable monitoring post that was measuring dose rate of main gate of the power station became unreadable. The data transfer was resumed at 4:00 pm on the same day.
- At approximately 10:00 am on September 12, we confirmed the instrument reading of transportable monitoring post that was measuring dose rate of main gate of the power station became unreadable. The data transfer was resumed at 10:30 am on the same day.

[Water]

- We detected radioactive materials contained in the sea water near the power station collected on August 1 to 3, 5, 8 to 11, 17 to 19, 21, 30 and September 13, 14, 23, 28 ,29 and 30. The data of three detected nuclides (Iodine-131, Cesium-134 and Cesium-137) were reported as fixed data. The valuation results of other nuclides were published based on the improved methods for recurrence prevention prepared in accordance to the strong warning by NISA on April 1.

  Strontium 89 and 90 were detected as a result of analysis conducted on strontium contained in the seawater sampled on August 15and September 12 near the Power Station.

- We detected Iodine-131, Cesium-134 and Cesium-137 in the sampling of sub-drain water near the turbine building conducted on August 1, 3, 5, 8, 10, 12, 15, 17, 19, 22, 24, 26, 29, 31 and September 2, 5, 7, 9, 12, 14, 16, 19, 21, 23, 26 ,29, 30, October 3, 5 and 7.

  Strontium 89 and 90 were detected as a result of analysis conducted on strontium contained in the sub-drain water sampled on August 15 and September 12.

  There were positive findings as a result of analysis conducted on tritium and all beta materials contained in the sub-drain water sampled on September 12.

[Marine soil]

- Cs-134 and Cs-137 were detected through a nuclide analysis in the marine soil sampled on August 6, 7, 8, 10, 23 and September 8, 9, 12, 14, 15, 16, 25 to 28 and October 7 in Fukushima Prefecture offshore.

<Accumulated water treatment facility>

- At 5:32 am on August 4, we stopped operation of the water treatment facility in order to improve the flow rate. After the work to improve the flow rate, we started water treatment facility at 3:30 pm on the same day and started water treatment at 4:13 pm.
- At 6:55 pm on August 4, decontamination facility automatically stopped due to the stop

of chemical injection pumps for ultra-high speed coagulation sedimentation facility and we stopped water treatment facility. We checked the soundness of the stopped pumps and started water treatment facility at 8:30 pm, and water treatment at 8:50 pm on the same day.

- At 2:12 am on August 5, a process error alarm was generated and we stopped the water treatment facility. We started the water treatment facility at 4:03 am and water treatment at 4:21 am on the same day.
- Around 7:00 pm on August 4, leakage was found from the flange of the hoses to transfer filtrate water which has been used for salt cleansing in the replacement vessel of cesium adsorption facility at On-site Bunker Building. New transfer horses are installed between cleansing facility to Miscellaneous Solid Waste Volume Reduction Treatment Building (High Temperature Incinerator Building).
- At 6:20 am on August 6, we stopped the water desalination facility and started inspection of the level switch of water tank of the water desalination facility from 8:30 am. We finished the inspection at 2:20 pm, and restarted the water desalination facility at 2:30 pm.
- At 8:07 am on August 7, water treatment facility has stopped as decontamination instrument has automatically stopped due to the trip of chemical injection pump of high speed coagulant facility. At 3:31 pm on the same day, operation for water treatment facility was resumed. After stroke adjustment for chemical injection pump (diaphragm type) was conducted to prevent motors from being overloaded, at 4:54 pm on the same day, we resumed water treatment.
- At 4:11 pm on August 7, we completed commissioning of additional two evaporative concentration apparatuses to the water treatment facility to make freshwater from condensed seawater from desalination facility. We put those additional facilities to full-scale operation.
- At 8:20 pm on August 8, Water Treatment Facility has stopped due to the water level gauge's error alarm of SPT tank. Subsequently, we confirmed no problems with Water Treatment Facility and the facility has started at 10:22 pm on the same day and resumed operation at 10:45 pm.
- Since SPT waste liquid pump and SPT receiving water transfer pump stopped due to power lost of water glass of SPT tank, an alarm showed low level of water at waste RO supply tank at 1:50 am on August 9 and water desalinations automatically stopped. At 6:57 am, water glass of SPT tank recovered. At 9:35 am on the same day, water desalinations restated as the water level at waste RO supply tank recovered.
- At 12:25 pm on August 11, water treatment facility stopped after a process error alarm was generated due to the water level of the decontamination instrument tank beyond the range measurable by the water level indicator. Later we judged it was a malfunction of the indicator since there was no abnormality such as the leakage. We reactivated it at 12:40 pm using another existing indicator, and then at 12:58 pm resumed the operation of the water treatment.
- At approximately 3:22 am on August 12, an M 6.0 earthquake with the seismic center at offshore of Fukushima prefecture occurred. The boiler for the evaporative concentration apparatus in the water treatment facility stopped. At 3:42 am on the same day, we restarted the boiler and resumed the apparatus
- At 6:17 pm on August 12, a process error alarm was generated in decontamination instruments and water treatment facility was stopped. At 10:59 pm on the same day, we restarted the facility, as we had not found any abnormality of it and estimated temporary abnormality of their control system. At 11:33 pm on the dame day, we resumed water treatment.
- At 7:11 am on August 13, we manually stopped Evaporative Concentration Apparatus (2B) in water desalination facility, as we found a hose injecting chemical to the evaporative apparatus was detached. We continue operating other apparatuses in the facility. After that, we connected the detached hose, inspected connection points of similar hoses, and at 12:01 pm, we resumed operation of Evaporative Concentration Apparatus (2B).
- At 12:04 pm on August 16, we stopped the operation of the water treatment system and started the trial operation of the second cesium adsorption instruments.
- At 2:43 pm on August 18, we started the operation of the water treatment system, and

the treatment of accumulated water with highly concentrated radioactive materials utilizing a combination of cesium adsorption instruments, second cesium adsorption instruments and decontamination instruments. At 3:50 pm on the same day, we confirmed that the flow rate had steadied, the water treatment operation was stable, and that there were no operational problems.

- At 2:00 pm on August 19, we stopped the operation of the water treatment system in order to switch to parallel operation of process line from cesium adsorption instruments to decontamination instruments, and another process line of second cesium adsorption instruments. At 3:44 pm on the same day, we started up the process line from cesium adsorption instruments to decontamination instruments. At 3:54 pm, it was confirmed that the rated flow was achieved and there were not any other problems to operation conditions. Afterward, at 7:33 pm on the same day, we started up the process line of second cesium adsorption instruments. At 7:41 pm, the rated flow was achieved and we started parallel operation.
- At 9:30 am on August 21, we started the desalination facility (reverse osmosis type) 1A and 1B. At 10:30 am on the same day, we confirmed stable operation.
- At approximately 4:00 pm August 23, 2011, we confirmed that Water Desalination 1B (Type of Reverse Osmosis Membrane) had stopped. At 6:20 pm on the same day, we restarted it.
- At 2:21 pm on August 26, cesium adsorption instruments stopped automatically due to the overload of transfer pump (A) for cesium adsorption treated water. At 4:54 pm we resumed the instruments by switching to transfer pump (B) for cesium absorption treated water. At 5:45, it reached normal volume of flow.
- At 11:45 pm on August 27, we stopped Water Desalination 1A (Type of Reverse Osmosis Membrane) because its filter needs to be replaced. At 10:54 am on August 28, we restarted the operation after changing the filter.
- At 7:00 am on August 29, we stopped Water Desalination 1B (Type of Reverse Osmosis Membrane) because its filter needs to be replaced.
- In order to modify the software, at 3:32 am on August 30, we stopped the evaporative concentration apparatus 2A. At 4:16 am, we stopped the evaporative concentration apparatus 2B. After that, at 7:09 am on the same day, we stopped the desalination facility (RO) 1A. At 7:16 am, we stopped the desalination facility (RO) 2. We are continuing water injection to Reactors for Units 1 to 3. We started the desalination facility (RO) 1A at 12:28 pm, and the desalination facility (RO) 2 at 12:42 pm on the same day. We started the evaporative concentration apparatus 2B at 3:44 pm and the evaporative concentration apparatus 2A at 4:34 pm on the same day,
- At 2:00 pm on August 31, we finished commissioning and started full operation of three evaporative concentration apparatuses which we had additionally installed in dissemination devices of water treatment facility.
- At around 3:00 pm on August 31, we confirmed water leakage near the sludge transfer pump (B) for the coagulation settling instruments inside the water treatment system (decontamination instruments). We bypassed a part of the coagulation setting instruments and segregated the pump's surroundings, and then the leakage stopped. The treatment of the accumulated water is continuing.
- Considering the current balance between the storage capacity of fresh water and the amount of water injection to reactors, we stopped all of the evaporative concentration apparatuses of water desalination facilities at 7:44 pm on September 4, while desalination and water injection through desalination facilities (reverse osmosis membrane type) continue.
- At 5:51 am on September 6, the decontamination instruments of Waste Treatment Facility stopped with an alarm indicating a mixer trouble of High Speed Coagulation Settling Facility. We reset and restarted the instruments. However, the same alarm and serious fault alarm went off at 6:21 am, and the decontamination instruments and Cesium adsorption Instruments stopped. As it was confirmed that the current value of overload trip of decontamination instruments was nearly the same level of that for normal operation, we adjusted the value and at 3:13 pm on the same day we restarted the water treatment facility, and at 4:35 pm it reached normal volume of flow.
- At 8:00 am on September 8, Cesium absorption apparatus No.2 at the water treatment facility stopped. As we found out that the cause was erroneous operation,

we restarted the apparatus at 12:09 pm on the same day. At 12:12 pm, the facility reached rated flow.

- At 10:06 am on September 12, waste liquid discharge pump (B) in the suppression pool water surge-tank (hereinafter called “SPT”) stopped due to overload. At 11:23 am on the same day, SPT waste liquid discharge pump (A) was activated. After that, we inspected SPT waste liquid discharge pump (B) and confirmed that there was no defect in the pump. At 11:53 am on the same day, we restarted SPT waste liquid discharge pump (B) and stopped SPT waste liquid discharge pump (A).
- At 3:58 am on September 13, we stopped Cesium adsorption Instruments and Decontamination instruments for maintenance work of water treatment system. At 6:16 pm on September 14, we started those instruments, and the rated flow was achieved at 7:20 pm.
- We found that the density of radioactive materials is increasing after treatment by decontamination instruments when we check the performance of treatment of water treatment instruments (decontamination instrument and cesium adsorption instrument). In order to find out causes, at 6:22 pm on September 15, we stopped operating the water treatment instruments and at 6:42 pm started to operate only the cesium adsorption instrument and it reached the rated flow (approx. 30 m^3/h) at 6:46 pm. With regard to the second cesium adsorption instrument, it has been in operation.
- Thereafter, in order to purify the water inside waste water tank, at 11:38 am on October 4, we started single circulating operation of decontamination facility.
- At 10:54 am on September 16, we could not monitor flow rate and pressure due to the fault of control board of second cesium absorption tower within the water treatment facility, we manually stopped operation of the facility. Thereafter, we replaced the control board and at 2:50 pm on the same day, restart the facility and at 2:57 pm returned to normal flow rate.
- At 2:16 pm on September 16, we stopped the desalination instrument (RO type) (2) and (3) as water leakage from the instrument (3) was confirmed. After detaching the instrument (3), we restarted the instrument (2) at 2:50 pm on the same day.
- It was confirmed that incorrect adsorption tower (2B) was installed in No.2 cesium adsorption instruments. At 9:47pm on September 20, the instrument was suspended when switching operation was given to the tower. At 10:02pm, the instrument was restarted and reached the regular water flow at 10:10pm.
- At 1:34 pm on September 21, regarding the water desalination equipment (reverse osmosis membrane type) (3), out of its 2 operation system lines, we restarted the instrument (3) with a different line that was not affected by water leakage.
- At 08:50 pm on September 21, a door of the large tent where water desalination equipment (reverse osmosis membrane type) (3) is installed malfunctioned and was subject to an inrush of rainwater due to the typhoon. In response, operations of this equipment have been ceased.
- At 4:53 pm on September 23, we started water treatment at two systems of second cesium adsorption facility. At 5:03 pm on the same day, the flow rate achieved steady state.
- At 9:42 am on September 24, we started operation of desalination facility (reverse osmosis type) (3), which had been stopped due to rain water leakage.
- At approx. 8:30 pm on September 24, the second Cesium adsorption facility of water treatment facility has automatically shut down. Investigations are now underway. Water treatment by Cesium adsorption facility is continuing. As there are sufficient treated water stored in the tank, there is no impact on the water injection into the reactors. After that, we identified that the cause of the shutdown was closure of a valve in the system due to malfunction of an air compressor for valve actuators. After replacing the compressor, at 5:02 pm on September 25, we restarted the 2nd Cesium absorption apparatus and at 5:05 pm, reached the rated flow.
- At approx. 6:17 pm on September 26, one of the pumps (H2-2) of the skid of the the Cesium adsorption apparatus has shut down. Throughput of the apparatus is decreased approx. from 20 m^3/h to 16 m^3/h. At 11:30 am on September 27, we started pump (SMZ-2) in the Skid for filtering out oil and technetium, and the

throughput was adjusted to approx. 20 m^3/h.

- At 10:20 am on September 29, we stopped the desalination instrument (RO type) (2) as water leakage from the flange connection of transferring horse of concentrated water side was confirmed. At 10:45 am on the same day, we confirmed stop of water leakage after stop of the instrument. At 11:40 am on the same day, we restarted the instrument by using another system different from the one that leaked out of 2 systems of process lines. At 11:27 am on September 30, the leaked flange connection was replaced so that the leaked system was resumed.
- At 2:19 pm on September 30, the oil separator treated water transfer pump was tripped due to overload so that the Cesium adsorption apparatus also tripped. At 5:38 pm, the backup pump was initiated and the water treatment by the apparatus was resumed. At 5:50 pm, the flow rate reached normal level. The cause of the overload is currently under investigation.
- At about 9:58 am on October 6, we stopped the operation of the Water Desalinations(reverse osmosis membrane) No2 and No3 because we found stain of leaked water in the water joint at the outlet piping of the Water Desalinations' waste RO supply pump. We fixed the outlet piping and at 1:01 pm on October 6, we restarted the operation of the Water Desalinations(reverse osmosis membrane) No2 and No3.
- A cooperative firm worker discovered leakage from hose for transferring reverse osmosis membrane concentrated water from the Water Desalinations (reverse osmosis membrane) at 11:45 am on October 8. In order to prevent the leakage, we brought a supply pump of the reverse osmosis membrane concentrated water and the water desalinations No. 2and 3 down. After that, we confirmed a leakage stop at 00:40 pm. We will replace the hose. We changed a line, restarted the water pump and at 2:00 pm on the same day, the water desalinations No.2 and 3 restarted operations.
- At 11:45 am on October 9, we finished a trial operation of 3 sets (3A, 3B, and 3C) of the evaporation condensation equipment which we had additionally installed within the water treatment desalination system and we found no trouble in the equipment.

<Transferring accumulated water in Centralized Radiation Waste Treatment Facility >

- At 1:58 pm on July 31, at Centralized Radiation Waste Treatment Facility, we started transferring accumulated water at Miscellaneous Solid Waste Volume Reduction Treatment Building (High Temperature Incinerator Building) to Process Main Building .At 10:21 am on August 1, we stopped the transfer.
- At 9:49 am on August 8, we started transferring accumulated water from miscellaneous solid waste volume reduction treatment building (high temperature incinerator building) to process main building at centralized radiation waste treatment facility. At 6:32 pm on the same day, we stopped the transfer.
- At 10:06 am on August 10, we started transferring accumulated water from On-site Bunker Building to Centralized Radiation Waste Treatment Facility. At 2:19 pm on same day, we stopped transferring.
- In the Centralized Radiation Waste Treatment Facility at 8:50 am on August 17, we started transferring water from Miscellaneous Solid Waste Volume Reduction Treatment Building (High Temperature Incinerator Building) to Process Main Building. At 5:25 pm on the same day, we finished the transfer.
- At 10:20 am on August 21, we started transferring accumulated water from Site bunker building to Process main building at Centralized Radiation Waste Treatment Facility. At 2:31 pm on the same day, we finished the transfer.
- At 10:19 am on September 7, we started transferring accumulated water from Site bunker building to Process main building at Centralized Radiation Waste Treatment Facility. At 4:01 pm on the same day, we stopped transfer.
- At 10:37 am on October 3, in Centralized Radiation Waste Treatment Facility, we started transferring accumulated water at On-site Bunker Building to Process Main Building. The transfer was stopped at 4:00 pm.

<Common spent fuel pool>

*common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

- At 11:04 am on July 30, we started transferring accumulated water in spent fuel common pool building to the tank located at upper stream of water desalinations (tank located at down stream of suppression pool water surge-tank) and stopped transferring at 5:45 am on August 2.
- At 11:08 am on September 14, the Common Pool's cooling system was shutdown to move a Common Pool Power Center so that we will replace a power panel installed at the basement of Spent Fuel Common Pool. At 5:22 pm on September 19, the transfer of the Common Pool Power Center was completed, Common Pool's cooling was restarted.
- At approximately 11:00 am on September 20, a puddle of water was found at the basement of common spent fuel pool. As a result of nuclide analysis of the water, some radioactive materials (Cs 134: $4.7 \sim 7.0 \times 10^0$ [Bq/cm3], Cs 137: $5.4 \sim 8.1 \times 10^0$ [Bq/cm3], Co 60: 1.2×10^0 [Bq/cm3]) were detected. However we assume that there is no leakage outside because any pipeline connecting to the outside does not exist. We are now investigating sources of the influent water.

<Injured / ill health> (Latest)

- At approximately 9:30 am on August 7, at cooperative firm rest area inside the site, a cooperative firm worker who was managing access control expressed dull feeling in the right knee and he was sent to Iwaki Kyoritsu Hospital by an ambulance. However, the cause was unknown. As a result of medical reexamination at Chiba Social Insurance Hospital, he was diagnosed as "Traumatic right knee synovialis ecchymoma"
- Around 12:05 pm on August 10, one partner company worker who was mowing for curing of water treatment hose at west side of Centralized Radiation Waste Treatment Facility (outside) was injured by sickle and was transferred to the Fukushima Rosai Hospital by the ambulance at 2:11 pm. His body has no contamination. He has been diagnosed as contused wound of lower right thigh.
- At approx. 2:40 on August 26, a worker from a partner company (contractor) was injured while engaged in a preparatory work to remove debris accumulated on Reactor Building, Unit 3. At 4:05 pm, after medically examining and treating at Emergency Medicare Room of Units 5 & 6, we ambulanced him to J Village. At 5:32 pm, he was sent to Fukushima Rosai Hospital, and was diagnosed "a fractured second finger", but not radioactively contaminated.
- At 9:35 am on August 31, we implemented the drainage work of spent vessels at the temporary storage area for spent vessels for the water treatment system. When workers, who assumed the valve was closed, dismantled the hose, water from the tank and the hose scattered towards two (2) workers from one of our affiliated companies. High-level radiation dose was confirmed by measuring the radiation of the filters of the mask worn by the workers. On the other hand, we confirmed that there was internal exposure dose after checking by WBC.
- On September 8, a worker of co-operating company forgot to bring the full-face mask when that worker commuted from J-Village to Fukushima Daiichi Nuclear Power Station. At 5:55 am, when the worker entered the Main Anti-Earthquake Building, it was found out that the worker did not wear the full-face mask. We evaluated the internal exposure dose of the worker and confirmed that the level was insignificant to cause bodily influence.
- At 12:40 pm on September 14, we found 4 out of 6 partner company workers contaminated when we were decontaminating the full-face masks of the workers who were engaged in maintenance work of the water processing system. By the use of whole body counter, we will check if they have take in radioactive materials. Then, as a result of the measurement by whole body counter, we have evaluated that no one took in radioactive materials.
- At approximately 4 pm on September 14, a TEPCO employee who returned from the patrol on the generators of Units 1 to 4 (outdoors) to Visitors Hall of Fukushima Daini Nuclear Power Station got decontaminated since contamination at his chin and neck was detected. Then as a result of the measurement by whole body counter, we have evaluated that no radioactive materials was taken in.

- At approximately 8:18 am on September 15, we found a partner company worker unequipped with a charcoal filter to the full-faced mask after the worker entered the site of Fukushima Daiichi Nuclear Power Station. Then as a result of the measurement by whole body counter, we have evaluated that no radioactive materials was taken in.
- At approximately 9:40 am on September 20, a hand of a worker of a partner company who was moving the on-house transformer outside hit his own full-face mask, and the filter of his mask came off temporarily. Afterwards, as a result of measurement by the whole body counter, we confirmed that there was no internal exposure.
- One of the staff from the cooperating companies was injured catching his forth finger between the steel stocks in site of the power plant (outdoors) at 11:05 am, September 26. The staff returned to the office outside the site and headed for the emergency medical office with a surgical mask on. As a result of the measurement by whole body counter, we have evaluated that no radioactive materials was taken in Contamination on the surface of the body and the surgical mask is not detected.
- We confirmed that there was internal exposure dose after checking by WBC
- Radio active contamination was detected from left waist, chin and jugular of one TEPCO's staff who had confirmed the situation of liquid leakage from water desalinations (reverse osmosis membrane type), when he returned to the visitor hall of Fukushima Daini Nuclear Power Station at 4:31 pm on October 8, 2011. He was checked by the whole body counter and according to the result, we evaluated he ingested no radioactive material.

Fukushima Daini Nuclear Power Station

Units 1 to 4: Shutdown due to the earthquake

- The national government has instructed evacuation for those local residents within 10km radius of the periphery.
- From July 29, we are conducting major inspections of 6 Monitoring Posts located (No. 1 to 6) at the boundary of power station's premise out of 7 Monitoring Posts.

  (Regular inspection)

  MP No. 6: regular inspection from 9:31 am to 6:30 pm on July 29.

  MP No. 1: regular inspection from 9:31 am on August 2 to 2:30 pm on August 3.

  MP No. 3: regular inspection from 9:31 am to 6:00 pm on August 4.

  MP No. 4: regular inspection from 9:31 am to 5:40 pm on August 5.

  MP No. 5: regular inspection from 9:31 am to 8:00 pm on August 8

  MP No. 2: regular inspection from 9:31 am to 5:40 pm on August 9

【Unit 1】

- Unit 1 residual heat removal system (B) was stopped at 6:25 am, September 26 in order to transfer the power supply cable (temporarily installed) to the residual heat removal systems (B) of Units 1 and 2. We restarted the residual heat removal system (B) at 4:15 pm on the same day.
- At 6:00 pm on September 30, grease oozing was confirmed at the joint connecting the pump for residual heat removal system (B) and the motor. At 9:58 am on October 1, the residual heat removal system (B) was stopped to conduct an inspection. As a result of inspection, we assumed grease oozing was occurred due to excessive grease filling to the joint connecting. After that, we adjusted fill ration of grease. At 4:21 pm on the same day, we resumed cooling reactor by residual heat removal system (B).

【Unit 2】

- From 2:22 pm to 3:02 pm on August 6, we conducted commissioning of Residual Heat Removal (RHR) system (A) of Unit 2, which had been stopped due to tsunami and it has transited to stand by mode.
- At 1:57 pm on August 8, we stopped residual heat removal system (B) due to the switching of temporary power cables in the heat exchanger building of Unit 2. At 2:29 pm, we activated residual heat removal system (A).
- At 12:59 pm on August 30, while operating High Pressure Core Spray Component Cooling System*1 and High Pressure Core Spray Component Cooling Sea Water

System*2 in order to adjust the water quality in High Pressure Core Spray Component Cooling System, the motor of High Pressure Core Spray Component Cooling Sea Water System Pump stopped. Later, we confirmed a defect in insulation resistance at the site. As Unit 2 is in cold shutdown and necessary functions of water injection are secured, it satisfies obligations under the safety provisions for security management.

- At 10:57 am on September 25, we stopped residual heat removal system (B) of Unit 2 due to the replacement work of temporary power cables for the residual heat removal system (B) of unit 1 and 2. At 11:11 am, we activated residual heat removal system (A). At 6:25 am on September 26, we stopped Residual Heat Removal System (B) of Unit 1.
- At 10:57 am on October 4, Residual Heat Removal System (A) has stopped due to the replacement of cable (temporary) to Residual Heat Removal System (A) of Unit 2. At 11:18 am on the same day, Residual Heat Removal System (B) has started.
- At 11:25 am on October 7, we stopped Residual Heat Removal system (B) regarding switching work from Residual Heat Removal system (B) to (A), and started operation of Residual Heat Removal system (A) at 11:42 am on the same day.

【Unit 3】

- At 11:53 am on August 31, we completed restoring and started operating Unit 3 emergency diesel generator (A).
- At 2:00 pm on August 8, we stopped a residual heat removal system of Unit 3 (B) and activated Unit 3 (A) at 2:26 pm on the same day in order to switch the operation from (B) to (A).

【Unit 4】

- From 11:54 am to 12:24 pm on August 2, we conducted a test run of the residual heat removal system (A) of Unit 4, which was stopped due to the influence of tsunami and then it has been kept in standby condition.
- At 10:33 pm on August 3, we stopped operation of Residual Heat Removal System due to switching from the Residual Heat Removal System (A) to the Residual Heat Removal System (B) with switching the temporary cable of heat exchanger building of Unit 4. At 11:00 pm on the same day, we restarted the operation.
- At 10:15 am on 29th August, in order to investigate soundness of reactor containment vessel and inside facilities, we have opened airlock for site workers (hatch to enter into the primary containment vessel), and we started investigation.
- At 3:43 pm on October 4, Residual Heat Removal System (A) has stopped due to the replacement of cable (temporary) to Residual Heat Removal System (A) of Unit 4. At 3:53 pm, Residual Heat Removal System (B) has started. As the replacement was finished, the Residual Heat Removal System (B) of Unit 4 has stopped at 5:01 pm on October 5, and the Residual Heat Removal System (A) has started at 5:08 pm.

【Others】

- On August 29, in the heater building of Unit 4, condition of a site worker of co-operating company who was in charge of rerouting the temporary cable got worse. At around 10:50 am, as heat stroke was suspected, we treated the patient with drip infusion and at 11:26 am, we transferred to J-Village by our ambulance. At 11:58 am, the patient was transferred to Iwaki Kyoritsu Hospital by ambulance. No radioactive material attached to the body was found. The doctor examined and confirmed that the patient had heat stroke.
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Kashiwazaki Kariwa Nuclear Power Station

Units 5, 6: Normal operation
(Units 1 to 4 7: Outage due to regular inspections)