Fukushima Daiichi Nuclear Power Station

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

- The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.
- Off-site power has been connected to Units 1 to 6 by March 22, 2011.
- At approximately 6:38 AM, April 12th, fire has been found at the distribution switchboard containing batteries located in the sampling equipment switchbox situated close to the south water discharge channel for Units 1-4. The self defense fire fighting team conducted the fire fighting at an early stage. At the same time, at approximately 6:45 AM, we reported to the Futaba fire authorities. There is no impact on the external release of radioactive substances or on the cooling capability of the reactor from this incident. There has been no change on the monitoring figures of the surrounding environment. The Futaba fire authorities confirmed fire extinguishment on site survey at 9:12 AM, April 12th.

【Unit 1】

- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36 pm, March 12.

<Water injection to the reactor>

- At 8:20 pm, March 12 sea water injection was started. Later boric acid which absorbs neutron was added.
- At approx. 2:30 am, March 23: sea water injection through feed water system was started. At 3:37 pm March 25, it was switched to the fresh water. At 8:32 am, Mar 29th, the fire pump used to inject fresh water was replaced by a temporary motor driven pump. From 10:42 am to 11:52am on April 3, the fire pump was temporarily used for the water injection in order to switch the power of the motor driven pump from temporary power to the off-site power. It was again switched to the motor driven pump, and the fresh water injection is continued.
- Water injection to the reactor was temporarily suspended due to a partial shutdown of the off-site power caused by the earthquake which occurred at approximately 5:16pm, April 11th. Following the restoration of off-site power, water injection resumed at approximately 6:04pm.

<Water spray to the spent fuel pool>

- The sea water spray was conducted using the concrete pumping vehicle from 1:03 pm to 4:04 pm, March 31.
- In order to confirm the position of water spray to the spent fuel pool by the concrete pumping vehicle, the sea water spray was conducted from 5:16 pm to 5:19 pm, April 2.

<Draining water from underground floor of Turbine building>

- At approximately 5:00 pm, March 24, draining water from the basement of the turbine building into a condenser was started. It was paused at approx. 7:30 am, March 29th because it reached almost full capacity. In order to move the water in the condenser to a condensate storage tank, water in the condensate storage tank was transferred to suppression pool's water surge-tank from around 0:00 pm, March 31 to 3:26 pm, April 2.
- The water transfer from the condenser to the condensate storage tank was started at 1:55 pm, April 3. It was completed at 9:30 am, April 10.

<Injection of nitrogen gas to the primary containment vessel>

- .As it is suspected that hydrogen gas may be accumulated inside the primary containment vessel, at 10:30 pm, April 6, we started the operation of the valve for the injection of nitrogen to the vessel in order to prevent the increase of oxygen density. Following this, nitrogen injection to the vessel was started at 1:31am, April 7.
- Injection of nitrogen to the vessel was suspended due to the earthquake which occurred at approximately 5:16pm, April 11th, and started again at 11:34 pm on the same day.

<Others>

- Lights in the main control room were turned on at approx. 11:30 am, March 24.
- Some of turbine building lights were turned on April 2.

【Unit 2】

- At approx. 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there was a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and contract workers not in charge of water injection work started tentative evacuation to a safe location. Sea water injection to the reactor continued.

<Water injection to the reactor>

- At 1:25 pm, March 14, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function).
- At 5:17 pm, March 14, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At 10:10 am on March 26, fresh water (with boric acid) injection was initiated. (switched from the seawater injection)
- At 6:31pm, March 27, the fire pump used for the injection was switched to a temporary motor driven pump.
- From 10:22 am to 0:06pm on April 3, the fire pump was temporarily used for the water injection in order to switch the power of the motor driven pump from temporary power to the off-site power. It was again switched to the motor driven pump, and the fresh water injection is continued.
- Water injection to the reactor was temporarily suspended due to a partial shutdown of the off-site power caused by the earthquake which occurred at approximately 5:16pm, April 11th. Following the restoration of off-site power, water injection resumed at approximately 6:04pm.

<Water spray to the spent fuel pool>

[Seawater spray]

- From approx. 3:05 pm to approx. 5:20 pm on March 20: about 40 tons of sea water injection (by TEPCO).
- From approx. 4:00 pm to approx. 5:00 pm on March 22: about 18 tons of sea water injection (by TEPCO).
- From approx. 10:30 am to approx. 0:19 pm on March 20: sea water injection through Fuel Pool Cooling and Filtering System (by TEPCO).

[Freshwater spray]

- From approx. 4:30 pm to approx. 6:25 pm on March 29: fresh water injection through Fuel Pool Cooling and Filtering System (Switched to fresh water injection).
- At 9:25 am, March 30th, we started fresh water injection by a temporary motor driven pump, but we switched the pump to the fire pump due to the pump trouble. At 1:10 pm, March 30th, fresh water injection was suspended, because we found the crack on a part of the hose. At 7:05 pm, March 30th, freshwater injection was resumed and finished at 11:50 pm, March 31.
- From approx. 2:56 pm to approx. 5:05 pm on April 1: water injection using the temporary motor driven pump.
- From approx. 11:05 am to approx. 1:37 pm on April 4: water injection using the temporary motor driven pump.
- From approx. 1:29 pm to approx. 2:34 pm on April 7: water injection using the temporary motor driven pump.
- From approx. 10:37 am to approx. 0:38 pm on April 10: water injection using the temporary motor driven pump.
- From approx.1:15 pm to approx. 2:55pm on April 13: water injection using the temporary motor driven pump

< Draining water from underground floor of Turbine building >

- In order to drain the accumulated water in the basement of the turbine building to a condenser, at approx. 4:45 pm, March 29, the water in a condensate storage tank was started to be transferred to suppression pool's water surge-tanks as a preparatory work for the water transfer from a condenser to a condensate storage tank. At 11:50 am, April 1, transfer was completed.
- The water transfer from the condenser to the condensate storage tank was started at 5:10 pm, April 2. It was finished at 1:10 pm, April 9.

<Power>

- On March 18th, power was delivered up to substation for backup power through offsite transmission line. Cables were laid on further to unit receiving facility in the building. At 3:46 pm, March 20 the load-side power panel of the receiving facility was energized.

<Others>

- Lights in the main control room were turned on at approx. 4:46 pm, March 26.
- Some of turbine building lights were turned on April 2.

【Unit 3】

- ~~At 6:50 am, March 14, the pressure in the primary containment vessel increased to 530 kPa. As a result. Thus, at 7:44 am, it was determined that a specific incident stipulated in the Article 15, the Clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, March 14, 490 kPa).~~

  * We announced in our past reports that "On March 14, the pressure in the primary containment vessel increased and it was determined that a specific incident stipulated in the Article 15, the Clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred". However, we made a mistake in the calculation of the pressure value and the status of Unit 3 did not fall under the above-mentioned specific incidents. We will delete the related description from our latest report.

- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 contract workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- Since 6:15 am, March 17, the pressure of the Suppression Chamber temporarily increased, on March 20, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it was not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- At approx. 3:55 pm, March 21, light gray smoke was confirmed arising from the southeast side of the roof of the reactor building. The situation was reported to the fire department at approx. 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored figures at the surrounding areas remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22, the color of smoke changed to somewhat white and it was slowly disappearing.
- At approx. 4:20 pm on March 23, light black smoke was observed belching from the reactor building. The situation was reported to the fire department at approx. 4:25 pm. The parameters of the reactor, the primary containment vessel, and monitored figures at the surrounding area remained stable without significant change. To be safe, workers in the main control room of and around Unit 3 evacuated to a safe location. At approx. 11:30 pm on March 23 and 4:50 am on March 24, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.

<Water injection to the reactor>

- High Pressure Coolant Injection System automatically stopped. We endeavored to restart the Reactor Core Isolation Cooling System but failed. Also, we could not confirm the water inflow of Emergency Core Cooling System. As such, we decided at 5.10am, Mar 12, and we reported and/or noticed the government agencies concerned to apply the clause 1 of the Article 15 of the Radiation Disaster Measure at 5:58am, Mar 13.
- At 6:02 pm on March 25, the injection of fresh water to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28, the fire pump used to inject water was replaced by temporary motor driven pumps. From 10:03 am to 0:16pm on April 3rd, the fire pump was temporarily used for the water injection in order to switch the power of the motor driven pump from temporary power to the off-site power. It was again switched to the motor driven pump, and the fresh water injection is continued.
- Water injection to the reactor was temporarily suspended due to a partial shutdown of the off-site power caused by the earthquake which occurred at approximately 5:16pm, April 11th. Following the restoration of off-site power, water injection resumed at approximately 6:04pm.

<Water spray to the spent fuel pool>

[Freshwater spray]

- From past 7:00 pm to 8:09 pm, March 17 the police and Self-Defense Forces sprayed fresh water by water cannon trucks upon our request for the cooperation.
- From before 2:00 pm 2:45 pm, March 18 Self-Defense Forces and the United States Armed Forces sprayed fresh water by water cannon trucks upon our request for the cooperation.

[Seawater spray]

- Upon our request for the cooperation, spraying water by helicopters with the support of the Self Defense Forces was considered On March 16. However the operation was cancelled.
- Water was sprayed by helicopters on March 17 upon our request for the cooperation to Self-Defense Forces.
- From approx. 0:30 am to approx. 1:10 am, March 19, water was sprayed with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. They resumed the operation from approx. 2:10 pm to 3:40 am, March 20.
- From approx. 9:30 pm, March 20 to 3:58 am, March 21, water was sprayed with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department.
- From approx. 3:10 pm to approx. 4:00 pm, March 22, water was sprayed with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department.
- Sea water was injected through Fuel Pool Cooling and Filtering System;
  - From approx. 11:00 am to approx. 1:20 pm on March 23
  - From approx. 5:35 am to 4:05 on March 24
- From approx. 1:28 pm to 4:00 pm, March 25, water was sprayed with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department.
- From approx. 0:34 pm to 2:36 pm, March 27, water was sprayed by the concrete pumping vehicle.

[Fresh water spray]

- From approx. 2:17 pm to 6:18 pm, March 29, fresh water was sprayed by the concrete pumping vehicle (switched to fresh water spray).
- Fresh water was sprayed by the concrete pumping vehicle;
  - From 4:30 pm to 7:33 pm, March 31 / From 9:52 am to 0:54 pm, April 2
  - From 5:03 pm to 7:19 pm, April 4 / From 6:53 am to 8:53 am, April 7
  - From 5:06 pm to 8:00 pm, April 8 / From 5:15 pm to 7:15 pm, April 10
  - From 4:26 pm to 5:16 pm, April 12

< Draining water from underground floor of Turbine building >

- In order to drain the accumulated water in the basement of the turbine building to a condenser, at approx. 5:40 pm, March 28, the water in a condensate storage tank was started to be transferred to suppression pool's water surge-tanks as a preparatory work for the water transfer from a condenser to a condensate storage

tank. At approx. 8:40 am, April 2, transfer was completed.

<Others>

- Lights in the main control room were turned on at approx. 10:45 pm on March 22.
- Some of turbine building lights were turned on April 2.

【Unit 4】

- At approx. 6:00 am, March 15, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the northwest part of 4th floor of Unit 4 reactor building was confirmed. At approx. 11:00 am, TEPCO employees confirmed that the fire was extinguished.
- At approx. 5:45 am on March 16, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approx. 6:15 am, TEPCO staff confirmed at the site that there were no signs of fire.

<Water spray to the spent fuel pool>

[Freshwater spray]

- From approx. 8:21 am to approx. 9:40 am, March 20, water was sprayed by fire engines with the cooperation of Self-Defense Forces. From approx. 6:45 pm to 7:45 pm on the same day, water was sprayed by Self-Defense Forces' fire engines.
- From approx. 6:30 am to approx. 8:40 am, March 21, water was sprayed by fire engines with the cooperation of Self-Defense Forces and the United States Armed Forces.

[Seawater spray]

- Seawater was sprayed by the concrete pumping vehicle;
  - From approx. 5:20 pm to approx. 8:30 pm, March 22.
  - From approx. 10:00 am to approx. 1:00 pm March 23
  - From approx. 2:35 pm to approx. 5:30 pm March 24
- From 6:05 am to 10:20 am, March 25, sea water was injected through Fuel Pool Cooling and Filtering System.
- Seawater was sprayed by the concrete pumping vehicle;
  - From 7:06 pm to 10:07 pm, March 25 / From 4:55 pm to 7:25 pm March 27

[Freshwater spray]

- Fresh water was sprayed by the concrete pumping vehicle;
  - From 2:04 pm to 6:33 pm March 30 / From 8:28 am to 2:14 pm April 1
  - From 5:14 pm to 10:16 pm April 3 / From 5:35 pm to 6:22 pm April 5
  - From 6:23 pm to 7:40 pm April 7 / From 5:07 pm to 7:24 pm April 9
  - From 0:30 am to 6:57 am, April 13

<Others>

- On March 21, cabling has been completed from temporary substation to the main power center.
- Lights in the main control room were turned on at approx. 11:50 am on March 29.
- Some of turbine building lights were turned on March 31.
- In order to confirm the status of fuel stored in the spent fuel pool of Unit 4, we sampled water from the spent fuel pool. We are planning to conduct the nuclide analysis.

【Units 5 and 6】

- At 5:00 am on March 19, we started cooling the spent fuel pool of Unit 5 by activating the Residual Heat Removal System Pump (C). At 10:14 pm, we started cooling the spent fuel pool of Unit 6 by activating the Residual Heat Removal System Pump (B).
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- In order to prevent hydrogen gas from accumulating within the buildings, we have

made three holes on the roof of the reactor building for each of Units 5 and 6.

- At approx. 5:24 pm on March 23, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at 4:14 pm, March 24, and resumed cooling of reactor at 4:35 pm.

【Others】

<Detection of radioactive materials>

[Soil]

- Plutonium has been detected from the sample of soil at the site of Fukushima Daiichi Nuclear Power Station collected on March 21, 22, 25 and 28, Concentration level of Plutonium detected was same as that of under usual environment and it is considered not to be harmful to human health. We strengthened environmental monitoring of power station and surrounding environment just in case. Additionally Iodine, Cesium, Tellurium, Barium, Niobium, Ruthenium, Molybdenum, Technetium, Lanthanum, Beryllium, Silver have been detected from the sample of soil collected at Fukushima Daiichi Nuclear Power Station on March 21, 33, 25 and 28.

[Air]

- The values of radioactive materials (iodine, etc) measured contained in the air at the site exceeded normal figures. It was determined that a specific incident stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Extraordinary increase of radiation dose at site boundary) has occurred;
  - 4:17 pm March 12 (near MP 4)
  - 8:56 am March 13 (near MP 4)
  - 2:15 pm March 13 (near M 4)
  - 3:50 am March 14 (near MP 6)
  - 4:15 am March 14 (near MP 2)
  - 9:27 am March 14 (near MP 3)
  - 9:37 pm March 14 (near the main gate of the station)
  - 6:51 am March 15 (near the main gate of the station)
  - 8:11 am March 15 (near the main gate of the station)
  - 4:17 pm March 15 (near the main gate of the station)
  - 11:05 pm March 15 (near the main gate of the station)
  - 8:58 am March 19 (near MP 5)

- We detected radioactive materials in the air collected at the site of Fukushima Daiichi Nuclear Power Station on March 20, 21, 23 to April 12. The data of three detected nuclides (Iodine-131, Cesium-134 and Cesium-137) were reported as fixed data. Other nuclides figures are to be re-evaluated by the improved methods for recurrence prevention which have been prepared in accordance to the strong warning by NISA on April 1.
- Since permanent monitoring posts (MPs1 to 8) were restored, we keep monitoring and publicly announce the data from them.

[Water]

- On March 21, 23 to April 10 we detected radioactive materials from the seawater around the discharge canal of the station. The data of three detected nuclides (Iodine-131, Cesium-134 and Cesium-137) were reported as fixed data. Other nuclides figures are to be re-evaluated by the improved methods for recurrence prevention which have been prepared in accordance to the strong warning by NISA on April 1.
- We detected radioactive materials contained in the accumulated water in the turbine buildings of Units 1 to 4. We are planning to conduct water analysis in preparation for treating the water.
- The analysis of water will be carried out in Fukushima Daini Nuclear Power Station with support from other nuclear companies (Japan Atomic Energy Agency, Japan Nuclear Fuel Limited).
- At approx. 3:30 pm, March 27, we found water pooling in the vertical shaft of the trench outside of the turbine buildings for Units 1 to 3. The radiation dose at the

surface of the water amounted 0.4 mSv/h (Unit 1) and over 1,000 mSv/h (Unit 2). We could not confirm the amount of the radiation dose as for Unit 3. We keep observing the condition of the water in the vertical shaft. No significant changes in water level of the vertical shaft of the trench for Unit 1 to 3 were confirmed after the earthquake which occurred at approximately 5:16pm, April 11th.

- We detected niobium, tellurium, ruthenium, silver, tellurium, iodine, cesium, and ruthenium in the water collected at the trench of unit 1 on March 29. We took samples from the water in the trench of Units 2 and 3 on March 30, and conducted nuclide analysis on them. We are now confirming the results of the analysis.
- At approx. 9:30 am, April 2, we found that there was accumulated water in the shaft (concrete product) for storing power cables near the intake of water for Unit 2, that the spatial radioactive dose was over 1,000mSv/h and that the water spilled into the sea from the crack (approx. 20 cm) on the side of the shaft. Since there is a joint between the trench of Unit 2 and the shaft, based on the possibility that the accumulated water in the turbine building of Unit 2 was spilled into the sea through this joint, we injected fresh concrete to the shaft twice, however, we could not observe a change in the amount of water flowing into the sea. Therefore, we considered that a new method to stop the water and determined to use the polymer. On April 4, we injected the tracer from the vertical shaft to examine the flow path. We did not observe reduction of flow or change of color of water leaked. We checked the drawings and confirmed the route. At the same time, we checked the situation of the pit in detail and considered the possibility that the water was not from the pit, rather, from the joint between the piping upstream of the pit and the duct, then the water seeped through a layer of gravel below the piping. In order to stop that seepage from the layer of gravel, we decided to conduct the water sealing to the bedrock around the piping. We arranged for the specialist and gathered equipments. On April 5, liquid glass was injected to the bedrock. Tracer was put through the two new holes drilled near the pit to investigate the water flow. At 2:15 pm, April 5, it was observed the water with tracer came out from the crack on the concrete wall of the pit. At 3:07 pm, April 5, injection of coagulant from the holes was initiated and we have confirmed the outflow from the crack on the concrete wall of the pit has stopped at 5:38 am, April 6. We confirmed the water level has not been rising in the turbine building of unit 2. On April 6, a countermeasure by using rubber plate and fixer was implemented to prevent discharge of radioactive materials, and we are continuously monitoring for any existence of leakage. From 3:00pm April 5, a construction of installing large sandbags around the pier to prevent the outflow of the contaminated water from station's port on the south side to the ocean was started. In order to prevent water containing radioactive materials from spilling from a plant's port to the sea, we installed 120 meter wide double silt fences around a breakwater on the south of the station at 10:45 am on April 11. On April 12 and 13, we installed three iron plates in front of Unit 2 screen. At 1:50 pm on April 13, we installed silt fence (<u>double layered</u>) in front of Unit 3 and 4 screen. Iodine and Cesium were detected from the water sampled in the pit and in the sea near the water discharge. Other nuclide will be re-evaluated. In addition, from April 2nd, we will implement sampling at 15km offshore Fukushima Daiichi and Fukushima Daini Nuclear Power Stations(3 points have been added since April 5) and will evaluate these samples comprehensively. From 7:35PM on April 12, we started transferring accumulated water in Turbine Building from the trench of Unit 2 to the condenser. At 11:00AM on April 13, we stopped transferring accumulated water to check whether there was water leakage from condenser or not. We didn't find any problem, so we restarted transferring at 15:02PM of the same day. <u>At 17:04PM, the scheduled transfer was completed.</u>
- Since approx. 9:20 am, March 31, the water transfer from the vertical shaft of Unit 1 to the reservoir of the centralized environmental facility was conducted. We finished the task around 11:25 am of the same day.
- We found the accumulated water at the main process building of the centralized environmental facility. We analyzed and detected approx. 1.2×10^{1}Bq/cm³ of radioactivity in full dose in the Controlled Area and 2.2×10^{1}Bq/cm³ in full dose in

the Non-Controlled Area on March 29. On April 2, the transfer of water accumulated in the central environment facility to the turbine building of Unit 4 was started for the purpose of the draining that water.

- From April 3, the water level in the trench of Unit 3 increased by 15 cm. The route is not yet known, but there is a possibility that water in the turbine building of Unit 4 may be running to the trench of Unit 3. To be safe, at 9:22am, April 4, we stopped transferring water to the turbine building of Unit 4. At this moment, the water level in the trench of Unit 3 became stable after stopping the water transfer.
- There is plenty of radioactive wastewater in the turbine buildings. Especially, Unit 2's wastewater is very highly radioactive. To store this stably, it was decided that this needed to be transferred to the Central Radioactive Waste Disposal Facility. However, in that facility, ten thousand tons of low level radioactive wastewater is stored. In order to transfer more wastewater, we need to discharge the low level radioactive wastewater. In addition, as low radioactive subsurface water is piling up in sub-drain pits of Units 5 and 6 and a part of subsurface water is running into buildings. We are concerned that important equipment to secure the safety of reactors may be submerged. Based on the Section 1 of the Article 64 of the Nuclear Reactor Regulation Law, we have decided to discharge to the sea approx. ten thousand tons of the accumulated low level radioactive water and a total of fifteen hundred tons of the low level radioactive subsurface water stored in the sub drain pits of Units 5 and 6 as soon as we get ready. From 7:03 pm, April 4, we started discharge of the low level radioactive wastewater stored in the Central Radioactive Waste Disposal Facility to the south of the water discharge canal. We are confirming the amount of discharged water. Also, from 9:00 pm, April 4, we started discharging the low level radioactive wastewater stored in the sub drain pits of Units 5 and 6 by using one pump via the water discharge canal of Units 5 and 6. At 6:52 pm, April 9 we finished discharging water. The amount of water was approximately 1,323 tons. (We evaluate the impact on the discharge of the low radioactive wastewater to the sea as approx. 0.6 mSv per year per an adult if an adult eats adjacent fish and seaweeds everyday. The amount (0.6 mSv of effective radioactive doses per year) is one-forth of annual radioactive dose (2.4 mSv) to which the general public is exposed from nature.)
- On April 7, we knocked holes in the external walls of turbine buildings at Units 2 to 4 for the preparation of draining the accumulated water to the Central Radioactive Waste Disposal Facility. We are checking the heath in the building of centralized waste treatment facility.

<Freshwater supply>

- The first barge of the United States Armed Forces with fresh water to be used to cool down reactors etc. was towed by a ship of Maritime Self-Defense Force and docked at 3:42 pm on March 31. At approx. 3:58 pm, April 1^{s} we started to replenish filtrate tanks with the fresh water, and finished at 4:25 pm. At approx. 10:20 am, April 2, we resumed replenishing filtrate tanks with the fresh water, and finished at 4:40 pm.
- The second barge of the United States Armed Forces with the fresh water towed by the ship of Maritime Self-Defense Force came alongside the pier at approx. 9:10 am, April 2. It was in preparation for replenishing filtrate tanks with the fresh water.
- We began to transfer fresh water from the second barge to the first barge at 9:52 am, April 3 and continued until 11:15 am, April 3.
- At 11:35 am, April 1, a worker fell into the sea while stepping into the ship from the pier during the hose laying work of the barge. Other crew immediately rescued the worker. While no injury or contamination was confirmed, whole body counter has been implemented to check the contamination inside the body just in case.

<Spraying dust inhibitor>

- From 3:00 pm, April 1, we started spraying dust inhibitor in order to prevent diffusion of radioactive materials. This attempt was conducted on a trial basis at the mountain side area of the common spent fuel pool in the range of 500m^2. The

spraying finished at 4:05 pm. On April 5, we also sprayed dust inhibitor on a trial basis at the east and south sides of Unit 4, and the mountain side area of the common spent fuel pool in the range of 600m^2. On April 6 we sprayed at the mountain side area of the common spent fuel pool in the range of approx. 600m^2, Approx. 680 m^2 on April 8, approx. 550 m^2 on April 10, approx. 1,200 m^2 on April 11, approx.700 m^2 on April 12, approx. 400 m^2 on April 13 on a trial basis.

<Common spent fuel pool>

- On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool was secured. At around 10:37 am March 21, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was activated to cool the 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.

<Dry cask building>

- On March 17, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection was under preparation.

*dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

<Injured / ill health> (Latest)

- Approx. am on April 10, at the yard of Unit 2, a worker who wore an anorak and a full face mask said that he felt sick while he was laying a discharging hose. A medical staff accompanied him from Fukushima Daini Nuclear Power Station to J-Village conducting a course of injections in the car. After that, at 2:27 pm, he was sent to Sougou Iwaki Kyoritsu Hospital by an ambulance. No radioactive material attached to his body.
- No injured workers inside of the building were confirmed due to the earthquake which occurred at approximately 5:16pm, April 11th.

<Others>

- From 3:59 pm to 4:28 pm on April 10, we conducted video recording of Units 1 to 4 reactor buildings from the air by using an unmanned helicopter to check the current status.

Fukushima Daini Nuclear Power Station

Units 1 to 4: Shutdown to the earthquake

- The national government has instructed evacuation for those local residents within 10km radius of the periphery.
- In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown; Unit 1 at 5:00 pm, March 14, Unit 2 at 6:00 pm, March 14, Unit 3 at 0:15 pm, March 12, and Unit 4 at 7:15 am, March 16.
- At 2:30 pm on March 30, the power source of the residual heat removal system (B) to cool the reactor of Unit 1 was secured from an emergency power source in addition to an offsite power. This means that all the units secure backup power sources (emergency power sources) for the residual heat removal system (B).
- As radiation dose measured at site boundary exceeded the threshold amount, it was determined on March 14 and 15 that a specific incident stipulated in article 10, clause 1(increase of radiations dose at site boundary) occurred. However, the measured amount has been below the threshold amount of 5 μSv/h afterwards. Site will be under continuous surveillance.

【Unit 1】

- As it was confirmed that the temperature of the Emergency Equipment Cooling

Water System [*1] was increasing, at 3:20 pm, March 15, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

【Unit 4】

- As it was confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System[*1] was decreased, at 8:05 pm, March 15, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

[*1] emergency water system in which cooling water (pure water) circulates which exchanged the heat with sea water in order to cool down bearing pumps and/or heat exchangers etc.

Kashiwazaki Kariwa Nuclear Power Station	Units 1, 5, 6, and 7: Normal operation Units 2 to 4: Outage due to regular inspections

END