

May 7, 2011

Nuclear and Industrial Safety Agency

## Seismic Damage Information (the 128th Release)

(As of 15:00 May 7, 2011)

Nuclear and Industrial Safety Agency (NISA) confirmed the current situation of Onagawa NPS, Tohoku Electric Power Co. Inc.; Fukushima Dai-ichi and Fukushima Dai-ni NPSs, Tokyo Electric Power Co. Inc. (TEPCO); Tokai Dai-ni NPS, Japan Atomic Power Co. Inc. as follows:

Major updates are as follows.

### 1. Nuclear Power Stations (NPSs)

#### ● Fukushima Dai-ichi NPS

- The transfer of the accumulated water (accumulated water with high-level radioactivity) from the trench of the turbine building of Unit 2 to the Radioactive Waste Treatment Facilities was temporarily suspended due to the construction of the pipes (the Reactor Feedwater System Piping) used for water injection into the reactor of Unit 3. (09:22 May 7)
- About 180t of fresh water was sprayed over the Spent Fuel Pool of Unit 4 using a Concrete Pump Truck (62m class). (From 12:38 till 17:51 May 6)
- Fresh water spraying was started over the Spent Fuel Pool of Unit 4 using a Concrete Pump Truck (62m class). (From 14:05 May 7)
- The accumulated water (about 120m<sup>3</sup>) in the basement of the turbine building of Unit 6 was transferred to the temporary tank. (From 14:00 till 17:00 May 6)
- The transfer of the accumulated water from the basement of the turbine building of Unit 6 to the temporary tank was started. (From 10:00 May 7)
- Full-scale implementation of spraying an anti-scattering agent in order to prevent the spread of radioactive materials was carried out by workers in an area of about 5,200m<sup>2</sup> on the west-side of the shallow draft quay, around the Radioactive Waste Treatment

- Facilities, and on the sports ground. (From 10:30 till 14:00 May 6)
- Full-scale implementation of spraying an anti-scattering agent in order to prevent the spread of radioactive materials was carried out in an area of about 4,000m<sup>2</sup> on the west-side of the reactor building of Unit 1 using an unmanned crawler dump. (From 11:00 till 14:00 May 6)
  - Removal of rubble (an amount equivalent to 7 containers) using remote-controlled heavy machinery was carried out. (From 09:00 till 16:00 May 6)

## 2. Actions Taken by NISA

- May 6 – NISA requested Chubu Electric Power Co., Inc. to ensure that effective protective measures against tsunamis are put in place, to stock spare parts for seawater pumps, as well as to install air-cooled emergency power generators, etc. Until these measures are completed and are evaluated and confirmed by NISA, Chubu Electric was requested to shut down all Units in their NPS.

For more information: NISA English Home Page  
<http://www.nisa.meti.go.jp/english/index.html>

(Attached sheet)

## 1. Situation of Operations at NPS (Number of Units Under Automatic Shutdown : 10)

- Fukushima Dai-ichi NPS, TEPCO  
(Okuma Town and Futaba Town, Futaba County, Fukushima Prefecture)

### (1) Operating Status

Unit 1 (460MWe):	automatic shutdown
Unit 2 (784MWe):	automatic shutdown
Unit 3 (784MWe):	automatic shutdown
Unit 4 (784MWe):	in periodic inspection outage
Unit 5 (784MWe):	in periodic inspection outage, cold shutdown at 14:30 March 20
Unit 6 (1,100MWe):	in periodic inspection outage, cold shutdown at 19:27 March 20

### (2) Major Plant Parameters (As of 12:00 May 7)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5 (cold shutdown)	Unit 6 (cold shutdown)
Reactor Pressure*1 [MPa]	0.564(A) 1.391(B)*3	0.081(A)*3 0.083(D)*3	0.022(A)*3 0.010(C)*3	—	0.107	0.117
Primary Containment Vessel Pressure (D/W) [kPa]	125	65	102.7	—	—	—
Reactor Water Temperature [°C]	-	-	-	-	47.6	26.1
Reactor Water Level*2 [mm]	-1,700(A) -1,650(B)	-1,500(A) -2,100(B)	-2,050(A) -2,150(B)	—	1,804	2,171
Suppression Pool Water Temperature (S/C) [°C]	51.0(A) 50.8(B)	66.9(A) 67.1(B)	40.0(A) 40.1(B)	—	—	—
Suppression Pool Pressure (S/C) [kPa]	115	Indicator Failure	183.2	—	—	—

Spent Fuel Pool Water Temperature [°C]	Indicator Failure	70.0	Indicator Failure	Indicator Failure	39.6	37.0
Time of Measurement	11:00 May 7	11:00 May 7	11:00 May 7	May 7	12:00 May 7	12:00 May 7

\*1: Converted from actual reading value to absolute pressure

\*2: Distance from the top of fuel

\*3: The trends and conditions are being confirmed on a continuing basis.

### (3) Situation of Each Unit

#### <Unit 1>

- TEPCO reported to NISA the event (Inability of Water Injection of the Emergency Core Cooling System) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11)
- Started to vent (10:17 March 12)
- Seawater injection into the Reactor Pressure Vessel (RPV) via the Fire Extinguishing Line was started. (20:20 March 12)  
→Temporary interruption of the injection (01:10 March 14)
- The sound of explosion in Unit 1 was heard. (15:36 March 12)
- The amount of injected water into the Reactor Core was increased by utilizing the Feedwater Line in addition to the Fire Extinguishing Line. (2m<sup>3</sup>/h→18m<sup>3</sup>/h). (02:33 March 23) Later, it was switched to the Feedwater Line only (about 11m<sup>3</sup>/h). (09:00 March 23)
- Lighting in the Main Control Room was recovered. (11:30 March 24)
- Fresh water injection into the RPV was started. (15:37 March 25)
- As a result of measuring the concentration at the surface of the stagnant water on the basement floor of the turbine building, 2.1×10<sup>5</sup>Bq/cm<sup>3</sup> of <sup>131</sup>I (Iodine) and 1.8×10<sup>6</sup>Bq/cm<sup>3</sup> of <sup>137</sup>Cs (Cesium) were detected as major radioactive nuclides.
- The pump for the fresh water injection into the RPV was switched from a fire engine pump to a temporary motor-driven pump. (08:32 March 29.)
- Stagnant water on the basement floor of the turbine building was transferred to the Condenser starting from around 17:00 March 24. As it was confirmed that the Condenser was almost filled with water,

pumping the water out to the Condenser was stopped. (07:30 March 29)  
In order to prepare for the transfer of the stagnant water from the basement floor of the turbine building to the Condenser, the water in the Condensate Storage Tank was transferred to the Surge Tank (A) of the Suppression Pool Water (from 12:00 March 31), and after switching the target to the Surge Tank (B) of the Suppression Pool Water (15:25 March 31), the transfer was resumed and completed. (15:26 April 2)

- About 90t (of fresh water) was sprayed over the Spent Fuel Pool using a Concrete Pump Truck (62m class). (From 13:03 till 16:04 March 31)  
Using a Concrete Pump Truck (62m class), water was sprayed on a trial basis in order to confirm the appropriate position for spraying water. (From 17:16 till 17:19 April 2)
- The lighting in the turbine building was partially recovered. (April 2)
- In order to switch the power supply for the motor-driven pump used for injecting fresh water into the RPV - from a temporary power supply to an external power supply - injection of fresh water into the reactor was temporarily carried out using a fire engine pump. (From 10:42 to 11:52 April 3)
- The power supply for injecting fresh water into the RPV was switched to external power. (12:02 April 3)
- In order to prepare for the transfer of the accumulated water from the basement floor of the turbine building to the Condenser, the transfer of the water in the Condenser to the Condensate Storage Tank was started. (13:55 April 3)
- Aiming at reducing the possibility of hydrogen combustion in the Primary Containment Vessel (PCV), the operation of injecting nitrogen into the PCV was started. (22:30 April 6)
- The start of nitrogen injection into the PCV was confirmed. (01:31 April 7)
- The nitrogen injection into the PCV was replaced by a High Purity Nitrogen Generator. (04:10 April 9)
- The transfer of water in the Condenser to the Condensate Storage Tank was completed. (09:30 April 10)
- Due to the occurrence of an earthquake (around 17:16 April 11, near Hamadori, Fukushima Prefecture), the external power supply was lost and fresh water injection into the RPV as well as nitrogen injection into

- the PVC were suspended. (Around 17:16 April 11)
- The external power supply was restored. (17:56 April 11)
  - Fresh water injection into the RPV was resumed. (18:04 April 11)
  - Nitrogen injection into the PCV was resumed. (23:34 April 11)
  - Confirmation of the situation, etc., using an unmanned robot at the reactor building was carried out. (From 16:00 till 17:30 April 17)
  - In order to replace a hose used for injecting water into the Reactor Core with a new hose, the pump for water injection was shut off. (From 11:50 till 12:12 April 18)
  - The power supply to the motor-driven pumps injecting fresh water into the Reactor Pressure Vessel was temporarily switched from external power to temporary diesel generator in order to carry out reinforcement works on the external power supply. (From 10:57 to 18:25 April 25)
  - In order to carry out reinforcement works on the external power supply, nitrogen injection into the PCV was temporarily suspended. (From 14:10 till 19:10 April 25)
  - Confirmation of the situation, etc., at the reactor building of Unit 1 using an unmanned robot was carried out. (From 11:35 till about 13:24 April 26)
  - The operation of gradually changing the water injection rate into the Reactor Pressure Vessel of Unit 1, from about 6m<sup>3</sup>/h to a maximum of about 14m<sup>3</sup>/h, was started. (10:02 April 27) After carrying out the injection at 10m<sup>3</sup>/h, the injection rate was changed back to 6m<sup>3</sup>/h. (10:14 April 29)
  - An investigation of the situation inside the reactor building using an unmanned robot was carried out. (From 11:36 till 14:05 April 29)
  - In order to install an alarm system to the pump used for injecting water into the reactor core, the injection of water into the reactor core was temporarily switched to a fire engine pump. (From 12:58 to 15:03 May 2)
  - The work to install ambient air filtration systems was started in order to improve the working environment of the reactor building of Unit 1. (May 2) All units of the ambient air filtration system (a total of 6 units) became operational. (16:36 May 5)
  - The rate of water injection into the Reactor Core was changed from 6m<sup>3</sup>/h to 8m<sup>3</sup>/h. (10:01 May 6)

- The emission of white smoke could not be confirmed. (As of 06:30 May 7)
- Fresh water injection into the RPV is ongoing. (As of 15:00 May 7)

## <Unit 2>

- TEPCO reported to NISA the event (Inability of Water Injection of the Emergency Core Cooling System) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11)
- Started to vent (11:00 March 13)
- The Blow-out Panel of the reactor building was opened due to the explosion in the reactor building of Unit 3. (After 11:00 March 14)
- The reactor water level tended to decrease. (13:18 March 14) TEPCO reported to NISA the event (Loss of Reactor Cooling Functions) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14)
- Seawater injection into the RPV via a Fire Extinguishing Line was started. (16:34 March 14)
- The water level in the RPV tended to decrease. (22:50 March 14)
- Started to vent (0:02 March 15)
- A sound of explosion was heard in Unit 2 and the pressure in the Suppression Pool (Suppression Chamber) declined. (06:10 March 15) There was a possibility that an incident occurred in the Chamber. (About 06:20 March 15)
- Electric power reception at the emergency power source transformer from an external power transmission line was completed. The work for laying an electric cable from there to the load side was carried out. (13:30 March 19)
- 40t of seawater was injected into the Spent Fuel Pool. (A fire engine pump was joined to a Cooling System pipe.) (From 15:05 till 17:20 March 20)
- The Power Center received electricity (15:46 March 20)
- White smoke was emitted. (18:22 March 21)
- The white smoke died down and became almost invisible. (As of 07:11 March 22)
- 18t of seawater was injected into the Spent Fuel Pool. (From 16:07 till 17:01 March 22)

- Seawater was injected into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line. (From 10:30 till 12:19 March 25)
- Injection of fresh water into the RPV was started. (10:10 March 26)
- The lighting in the Main Control Room was recovered (16:46 March 26)
- The pump for injecting fresh water into the RPV was switched from a fire engine pump to a temporary motor-driven pump. (18:31 March 27)
- Regarding the result announced by TEPCO on 27 March on the concentration measurement of the surface of the stagnant water on the basement floor of the turbine building of Unit 2, Fukushima Dai-ichi NPS, TEPCO reported to NISA that the measured value of  $^{134}\text{I}$  (Iodine) was judged to be wrong, and also reported that analysis and evaluation results through re-sampling indicated that, the concentrations of gamma nuclides, including that of  $^{134}\text{I}$  (Iodine), were less than the detection limit. (00:07 March 28).
- Seawater injection into the Spent Fuel Pool using a fire engine pump was switched to fresh water injection using a temporary motor-driven pump. (From 16:30 till 18:25 March 29 )
- A malfunction was identified at 09:45 March 30 in the temporary motor-driven pump which had been in use for injection into the Spent Fuel Pool from 09:25 of the same day. Therefore, the injection pump was replaced by a fire engine pump. However, because cracks were found in the hose (12:47 and 13:10 March 30), the injection was suspended. Fresh water injection was resumed. (From 19:05 till 23:50 March 30)
- Injection of about 70t of fresh water into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line using a temporary motor-driven pump was carried out. (From 14:56 till 17:05 April 1)
- In order to prepare for the transfer of the stagnant water from the basement floor of the turbine building to the Condenser, the water in the Condensate Storage Tank was transferred to the Surge Tank of the Suppression Pool Water. (From 16:45 March 29 till 11:50 April 1)
- Accumulated water with a dose rate at the surface exceeding 1,000 mSv/h was identified in a pit for a conduit holding electric cables, in a location near the Intake Channel. In addition, there was a crack about 20 cm long in a concrete lateral near the pit, from which outflow of water into the sea was confirmed. (Around 09:30 April 2) In order to



stop the outflow, concrete was poured into the pit. (16:25 and 19:02 April 2)

- In order to prepare for the transfer of the accumulated water from the basement floor of the turbine building to the Condenser, the transfer of the water in the Condenser to the Condensate Storage Tank was started. (17:10 April 2)
- Cameras were installed for monitoring water levels in the vertical shaft of the trench and on the basement floor of the turbine building. (April 2)
- The lighting in the turbine building was partially recovered. (April 2)
- In order to switch the power supply for the motor-driven pump injecting fresh water into the RPV - from a temporary power supply to an external power supply - fresh water injection into the reactor was temporarily carried out using a fire engine pump. (From 10:22 till 12:06 April 3)
- The power supply for the fresh water injection into the RPV was switched to external power. (12:12 April 3)
- As a measure to prevent the outflow of water accumulated in the pit near the Inlet Bar Screen of Unit 2, the top of the power cable conduit near the Intake Channel was crushed open and 20 bags of sawdust (3kg/bag), 80 bags of high polymer absorbent (100g/bag) and 3 bags (large garbage bags) of shredded newspaper were poured in. (From 13:47 till 14:30 April 3)
- About 13kg of tracer (milk white bath agent) was poured into the vertical shaft of the Seawater Pipe Duct. (From 07:08 till 07:11 April 4)
- Fresh water injection (about 70t) into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line using a temporary motor-driven pump was carried out. (From 11:05 till 13:37 April 4)
- The tracer solution was poured into the two holes made around the pit of the conduit near the Inlet Bar Screen of Unit 2, and it was confirmed that the solution flowed out from the crack into the sea. (14:15 April 5) A coagulant (soluble glass) was injected into the holes made near the pit in order to prevent the outflow of water. (From 15:07 April 5) It was confirmed that the outflow of water stopped. (Around 05:38 April 6) In addition, it was confirmed that the water level in the turbine building did not rise. Furthermore, a measure to stop the water by means of a rubber board and jig (prop) were implemented at the location of the

outflow. (Finished at 13:15 April 6)

- One more pump was installed for the transfer of water in the Condenser to the Condensate Storage Tank. (Total of 2 pumps: 30m<sup>3</sup>/h) (Around 15:40 April 5)
- Fresh water injection (about 36t) into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line was carried out. (From 13:39 till 14:34 April 7)
- The transfer of water in the Condenser to the Condensate Storage Tank was completed. (13:10 April 9)
- Fresh water injection (about 60t) into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line was carried out. (From 10:37 till 12:38 April 10)
- Due to the occurrence of an earthquake, the external power supply was lost, and the fresh water injection into the RPV was suspended. (Around 17:16 April 11)
- The external power supply was restored. (17:56 April 11)
- Fresh water injection into the RPV was resumed. (18:04 April 11)
- The accumulated water in the trench of the turbine building was transferred to the Hot Well of the Condenser using a submersible pump (From 19:35 April 12) This was temporarily suspended in order to confirm any leakages, etc. (11:00 April 13) After confirming that there were no leakages, the transfer of the accumulated water resumed from 15:02 April 13 and was stopped at 17:04 April 13. The amount that was transferred was about 660t.
- Fresh water injection (about 60t) into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line was carried out. (From 13:15 till 14:55 April 13)
- Fresh water injection (about 45t) into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line was carried out. (From 10:13 till 11:54 April 16.) Due to the occurrence of an earthquake at around 11:19, the temporary motor-driven pump was shut off at 11:39. The Spent Fuel Pool was confirmed to be filled with water based on the rise of the Skimmer Level at 11:54.)
- In order to replace the hose used for water injection into the Reactor Core to a new hose, the pump for water injection was shut off. (From 12:13 till 12:37 April 18)

- Confirmation of the situation at the reactor building, etc., using an unmanned robot was carried out. (From 13:42 till 14:33 April 18)
- Injection of about 17,000L of coagulant (soluble glass) into the conduit for power cables was carried out. (From 09:30 till 17:40 April 18)
- The sampling of water that flowed out into the Skimmer Surge Tank from the Spent Fuel Pool was carried out in order to grasp the condition of the water in the Pool. (April 16) As a result of a nuclide analysis of radioactive materials from the sampled pool water,  $4.1 \times 10^3 \text{Bq/cm}^3$  of  $^{131}\text{I}$  (Iodine),  $1.6 \times 10^5 \text{Bq/cm}^3$  of  $^{134}\text{Cs}$  (Cesium), and  $1.5 \times 10^5 \text{Bq/cm}^3$  of  $^{137}\text{Cs}$  (Cesium) were detected. (April 17)
- The transfer of the accumulated water (accumulated water with high-level radioactivity) from the trench of the turbine building to the Radioactive Waste Treatment Facilities was started. (From 10:08 April 19)
- Injection of about 7,000L of coagulant (soluble glass) into the conduit for power cables was carried out. (From 08:00 till 15:30 April 19)
- Fresh water injection (about 47t) into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line was carried out. (From 16:08 till 17:28 April 19)
- Fresh water injection (about 50t) into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line was carried out. (From 15:55 till 17:40 April 22)
- About 38t of fresh water was injected into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line. (From 10:12 till 11:18 April 25).
- The power supply to the motor-driven pumps injecting fresh water into the Reactor Pressure Vessel was temporarily switched from external power to temporary diesel generator in order to carry out reinforcement work on the external power supply. (From 10:57 till 18:25 April 25)
- About 43t of fresh water was injected into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line. (From 10:15 till 11:28 April 28)
- In order to carry out inspections, etc. of the transfer facilities, the transfer of accumulated water from the turbine building trench (accumulated water with high-level radioactivity) to the Radioactive Waste Treatment Facilities was temporarily suspended. (09:16 April 29) The transfer was resumed. (14:05 April 30)
- The work to block the trench pit was started. (From 13:35 May 1)

- Fresh water injection (about 55t) into the Spent Fuel Pool using the Fuel Pool Coolant and Clean-up System was carried out. (From 10:05 till 11:40 May 2)
- In order to install an alarm system to the pump used for injecting water into the reactor core, the injection of water into the reactor core was temporarily switched to a fire engine pump. (From 12:58 to 15:03 May 2)
- About 58t of fresh water was injected into the Spent Fuel Pool via a Fuel Pool Cooling and Clean-up Line. (09:36 till 11:16 May 6)
- The transfer of the accumulated water (accumulated water with high-level radioactivity) from the trench of the turbine building to the Radioactive Waste Treatment Facilities was temporarily suspended due to the construction of the pipes (the Reactor Feedwater System Piping) used for water injection into the reactor of Unit 3. (09:22 May 7)
- It was confirmed that white smoke continued to be emitted. (As of 06:30 May 7)
- Fresh water injection into the RPV is ongoing. (As of 15:00 May 7)

## <Unit 3>

- TEPCO reported to NISA the event (Inability of Water Injection of the Emergency Core Cooling System) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (05:10 March 13)
- Started to vent (08:41 March 13)
- Fresh water injection into the RPV via the Fire Extinguishing Line was started. (11:55 March 13)
- Seawater injection into the RPV via the Fire Extinguishing Line was started. (13:12 March 13)
- Seawater injection for Units 1 and 3 was suspended due to the lack of seawater in the pit. (01:10 March 14)
- Seawater injection into the RPV of Unit 3 was resumed. (03:20 March 14)
- Started to vent. (05:20 March 14)
- The PCV pressure rose unusually. (07:44 March 14) TEPCO reported to NISA on the event falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (07:52 March

14)

- An explosion similar to that of Unit 1 occurred around the reactor building. (11:01 March 14)
- Smoke resembling white steam was emitted. (Around 08:30 March 16)
- Because of a possibility of the PCV being damaged, the workers evacuated from the Main Control Room (common operation room). (10:45 March 16) Thereafter, the workers returned to the room and resumed the operation of injecting water. (11:30 March 16)
- Seawater was discharged 4 times onto Unit 3 by helicopters of the Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17)
- The riot police of the National Police Agency arrived at the site in order to spray water from the ground. (16:10 March 17)
- The Self-Defence Force started spraying water using a fire engine. (19:35 March 17)
- Water spraying was carried out by the riot police of the National Police Agency. (From 19:05 till 19:13 March 17)
- Water spraying was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17)
- Water spraying using 6 fire engines (6 tons of water spray per engine) was carried out by the Self-Defence Force. (From before 14:00 till 14:38 March 18)
- Water spraying was carried out using a fire engine provided by the U.S. Forces Japan (USFJ). (Finished at 14:45 March 18)
- The Hyper Rescue Unit of the Tokyo Fire Department carried out the water spraying work. (Finished at 03:40 March 20)
- The pressure in the PCV rose (320kPa at 11:00 March 20). Preparation to lower the pressure was carried out. However, judging from the situation, immediate pressure relief was not required, so monitoring of the pressure was continued. (120kPa at 12:15 March 21)
- On-site survey for pulling in electric cables was carried out. (From 11:00 till 16:00 March 20)
- Water spraying over the Spent Fuel Pool of Unit 3 was carried out by the Hyper Rescue Unit of the Tokyo Fire Department. (From 21:30 March 20 till 03:58 March 21)
- Grayish smoke was emitted.(Around 15:55 March 21)
- The smoke was confirmed to have died down. (17:55 March 21)

- Grayish smoke changed to whitish smoke and appeared to be ceasing. (As of 07:11 March 22)
- Water spraying (about 180t) by the Tokyo Fire Department and the Osaka City Fire Bureau was carried out. (From 15:10 till 16:00 March 22)
- The lighting was recovered in the Main Control Room. (22:43 March 22)
- Seawater injection (35t) into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line was carried out. (From 11:03 till 13:20 March 23) About 120t of seawater was injected. (From around 5:35 till around 16:05 March 24)
- Slightly blackish smoke was emitted from the reactor building. (Around 16:20 March 23) When checking the smoke at around 23:30 March 23 and around 04:50 March 24, it appeared that the smoke had died down.
- A result of an analysis of the stagnant water, to which workers who were laying electric cables on the ground floor and on the basement floor of the turbine building stepped in, indicated that the dose rate on the water surface was approximately 400mSv/h, and a result of a gamma-ray analysis of the sampled water indicated that the total concentration of each nuclide of the sampled water was approximately  $3.9 \times 10^6$  Bq/cm<sup>3</sup>.
- Water spraying was carried out by the Kawasaki City Fire Bureau supported by the Tokyo Fire Department. (From 13:28 till 16:00 March 25)
- Fresh water injection into the RPV was started. (18:02 March 25)
- About 100t of seawater was sprayed using a Concrete Pump Truck (52m class). (From 12:34 till 14:36 March 27)
- In order to prepare for the transfer of the stagnant water from the basement floor of the turbine building to the Condenser, the water in the Condensate Storage Tank was transferred to the Surge Tank of the Suppression Pool Water. (From 17:40 March 28 till around 8:40 March 31)
- The pump for injecting fresh water into the RPV was switched from a fire engine pump to a temporary motor-driven pump. (20:30 March 28)
- About 100t of fresh water was sprayed using a Concrete Pump Truck (52m class). (From 14:17 till 18:18 March 29)

- About 105t of fresh water was sprayed using a Concrete Pump Truck (52m class). (From 16:30 till 19:33 March 31)
- About 75t of fresh water was sprayed using a Concrete Pump Truck (52m class). (From 09:52 till 12:54 April 2)
- The lighting in the turbine building was partially recovered. (April 2)
- The camera for monitoring the water level in the vertical shaft of the trench was installed. (April 2)
- In order to switch the power supply for the motor-driven pump which was being used to inject fresh water into the RPV - from a temporary power supply to an external power supply - the injection into the reactor was temporarily carried out using a fire engine pump. (From 10:03 till 12:16 April 3)
- The power supply for fresh water injection into the RPV was switched to external power. (12:18 April 3)
- About 70t of fresh water was sprayed using a Concrete Pump Truck (52m class). (From 17:03 till 19:19 April 4)
- About 70t of fresh water was sprayed using a Concrete Pump Truck (52m class). (From 06:53 till 08:53 April 7)
- About 75t of fresh water was sprayed using a Concrete Pump Truck (52m class). (From 17:06 till 20:00 April 8)
- About 80t of fresh water was sprayed using a Concrete Pump Truck (52m class). (From 17:15 till 19:15 April 10)
- Due to the occurrence of an earthquake (around 17:16 April 11, near Hamadori, Fukushima Prefecture), the external power supply for Units 1 and 2 was lost, and fresh water injection into the RPV was suspended. (Around 17:16 April 11)
- Because the external power supply for Units 1 and 2 was restored (17:56 April 11), fresh water injection into the RPV was resumed. (18:04 April 11)
- About 35t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 16:26 till 17:16 April 12)
- About 25t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 15:56 till 16:32 April 14)
- Confirmation of the situation at the reactor building, etc., using an unmanned robot was carried out. (From 11:30 till 14:00 April 17)

- In order to replace the hose used for injecting water into the reactor with a new hose, the pump for water injection was shut off. (12:38 till 13:05 April 18)
- About 30t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 14:17 till 15:02 April 18)
- Fresh water was injected on a trial basis into the Spent Fuel Pool via the Fuel Pool Cooling and Clean-up Line. (From 13:40 till 14:00 April 22)
- About 50t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 14:19 till 15:40 April 22)
- The power supply to the motor-driven pumps injecting fresh water into the Reactor Pressure Vessel was temporarily switched from external power to temporary diesel generator in order to carry out reinforcement work on the external power supply. (From 10:57 till 18:25 April 25)
- About 47.5t of fresh water was injected into the Spent Fuel Pool using the Fuel Pool Cooling and Clean-up System. (From 12:25 till 14:02 April 26)
- In order to install an alarm system to the pump used for injecting water into the reactor core, the injection of water into the reactor core was temporarily switched to a fire engine pump. (From 12:58 to 15:03 May 2)
- It was confirmed that white smoke continued to be emitted. (As of 06:30 May 7)
- Fresh water injection into the RPV is ongoing. (As of 15:00 May 7)

#### <Unit 4>

- Because the replacement work of the Shroud of the RPV was ongoing, no fuel was inside the RPV.
- The water temperature of the Spent Fuel Pool rose. (84°C as of 04:08 March 14)
- It was confirmed that a part of the wall in the operations area was damaged. (06:14 March 15)
- A fire broke out. (09:38 March 15) TEPCO confirmed that the fire had died down spontaneously. (Around 11:00 March 15)
- A fire broke out. (05:45 March 16) TEPCO could not confirm the fire on the ground. (Around 06:15 March 16)



- The Self-Defence Force started to spray water over the Spent Fuel Pool. (09:43 March 20)
- An on-site survey for pulling in electric cables was carried out. (From 11:00 till 16:00 March 20)
- The Self-Defense Force sprayed water over the Spent Fuel Pool. (From around 18:30 till 19:46 March 20).
- The Self-Defence Force sprayed water over the Spent Fuel Pool using 13 fire engines. (From 06:37 till 08:41 March 21)
- The work of laying electric cables to the Power Center was completed. (Around 15:00 March 21)
- The Power Center received electricity. (10:35 March 22)
- About 150t of seawater was sprayed using a Concrete Pump Truck (58m class). (From 17:17 till 20:32 March 22)
- About 130t of seawater was sprayed using a Concrete Pump Truck (58m class). (From 10:00 till 13:02 March 23)
- About 150t of seawater was sprayed using a Concrete Pump Truck (58m class). (From 14:36 till 17:30 March 24)
- About 150t of seawater was sprayed using a Concrete Pump Truck (58m class). (From 19:05 till 22:07 March 25)
- Seawater injection into the Spent Fuel Pool via the Spent Fuel Pool Cooling and Clean-up Line was carried out. (From 06:05 till 10:20 March 25)
- About 125t of seawater was sprayed using a Concrete Pump Truck (58m class). (From 16:55 till 19:25 March 27)
- The lighting in the Main Control Room was recovered. (11:50 March 29)
- About 140t of fresh water was sprayed using a Concrete Pump Truck (58m class). (From 14:04 till 18:33 March 30)
- About 180t of fresh water was sprayed using a Concrete Pump Truck (58m class). (From 08:28 till 14:14 April 1)
- The lighting in the turbine building was partially recovered. (April 2)
- From April 2, the accumulated water in the main building of the Radioactive Waste Treatment Facilities was being transferred to the turbine building of Unit 4. From April 3, the water level in the vertical shaft of the trench in Unit 3 started to rise. Therefore, by way of precaution, the transfer was suspended notwithstanding that the path of the water was not clear. (09:22 April 4)

- About 180t of fresh water was sprayed using a Concrete Pump Truck (58m class). (From 17:14 till 22:16 April 3)
- About 20t of fresh water was sprayed using a Concrete Pump Truck (58m class). (From 17:35 till 18:22 April 5)
- About 38t of fresh water was sprayed using a Concrete Pump Truck (58m class). (From 18:23 till 19:40 April 7)
- About 90t of fresh water was sprayed using a Concrete Pump Truck (58m class). (From 17:07 till 19:24 April 9)
- The work of sampling water in the Spent Fuel Pool was carried out in order to grasp the condition of the fuel kept in the pool. (From 12:00 till 13:04 April 12) A nuclide analysis of radioactive materials was carried out on the sampled water from the Spent Fuel Pool. (April 13) As a result of the nuclide analysis,  $2.2 \times 10^2 \text{Bq/cm}^3$  of  $^{131}\text{I}$  (Iodine),  $8.8 \times 10^1 \text{Bq/cm}^3$  of  $^{134}\text{Cs}$  (Cesium), and  $9.3 \times 10^1 \text{Bq/cm}^3$  of  $^{137}\text{Cs}$  (Cesium) were detected. (April 14)
- About 195t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 0:30 till 6:57 April 13)
- About 140t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 14:30 till 18:29 April 15)
- About 140t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 17:39 till 21:22 April 17)
- About 40t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 10:17 till 11:35 April 19)
- About 100t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 17:08 till 20:31 April 20)
- About 140t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 17:14 till 21:20 April 21)
- The water level of the Spent Fuel Pool, etc., was measured by hanging a measuring device using a Concrete Pump Truck (62m class). (April 22)
- About 200t of fresh water was sprayed over the Spent Fuel Pool of Unit 4 using a Concrete Pump Truck (62m class). (From 17:52 till 23:53 April 22)
- About 140t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 12:30 till 16:44 April 23)
- About 165t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 12:25 till 17:07 April 24)

- About 210t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 18:15 April 25 till 0:26 April 26)
- About 130t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 16:50 till 20:35 April 26)
- About 85t of fresh water was sprayed using a Concrete Pump Truck (62m class). (From 12:18 till 14:01 and from 14:32 till 15:15 April 27)
- About 270t of fresh water was sprayed over the Spent Fuel Pool using a Concrete Pump Truck (62m class). (From 12:19 till 20:46 May 5)
- About 180t of fresh water was sprayed over the Spent Fuel Pool using a Concrete Pump Truck (62m class). (From 12:38 till 17:51 May 6)
- Spraying of fresh water over the Spent Fuel Pool using a Concrete Pump Truck (62m class) was started. (From 14:05 May 7)
- It was confirmed that white smoke continued to be emitted. (As of 06:30 May 7)

<Units 5 and 6>

- The first unit of the Emergency Diesel Generator (D/G) (B) for Unit 6 is operating and supplying electricity. Water injection into the RPV and the Spent Fuel Pool through the Make-up Water Condensate (MUWC) System is being carried out.
- The second unit of the Emergency Diesel Generator (D/G) (A) for Unit 6 started up. (04:22 March 19)
- The pumps for the Residual Heat Removal System (RHR) (C) for Unit 5 (05:00 March 19) and the pumps for the RHR (B) for Unit 6 (22:14 March 19) started up and the heat removal function was restored. Cooling of the Spent Fuel Pool was given priority. (Power supply: the Emergency Diesel Generator for Unit 6) (05:00 March 19)
- Unit 5 was brought to cold shutdown (14:30 March 20)
- Unit 6 was brought to cold shutdown (19:27 March 20)
- Electricity reached the starting transformers of Units 5 and 6. (19:52 March 20)
- The power supply to Unit 5 was switched from the Emergency Diesel Generator to external power. (11:36 March 21)
- The power supply to Unit 6 was switched from the Emergency Diesel Generator to external power. (19:17 March 22)
- The temporary pump for the Residual Heat Removal Seawater System

- (RHRS) of Unit 5 automatically shut off when the power supply was switched from a temporary to a permanent supply. (17:24 March 23)
- Repair of the temporary pump for the RHRS of Unit 5 was completed (16:14 March 24) and cooling resumed. (16:35 March 24)
  - The power supply for the temporary pump for the RHRS of Unit 6 was switched from a temporary to a permanent supply. (15:38 and 15:42 March 25)
  - Subsurface water in the Sub-Drain Pits of Units 5 and 6 which was received and managed in the low-level radioactivity facilities were discharged through the Water Discharge Canal to the sea. (Unit 5 from 21:00 April 4 till 12:14 April 8 (about 950t), Unit 6 from 21:00 April 4 till 18:52 April 9 (about 373t))
  - Accumulated water on the basement floor of the turbine building of Unit 6 (about 100 m<sup>3</sup>) was transferred to the Condenser. (From 11:00 till 15:00 April 19)
  - The pump for the RHR was temporarily shut off in order to reposition the hose of the temporary RHRS of Unit 6. (From 09:51 April 20) After transferring the pump of the temporary RHRS, cooling was resumed (15:56 April 20).
  - Due to reinforcement work on the external power supplies, the pumps for Residual Heat Removal (RHR) of Unit 5 were temporarily suspended. (From 12:22 till 16:43 April 25)
  - Accumulated water in the basement of the turbine building of Unit 6 (about 120m<sup>3</sup>) was transferred to a temporary tank. (From 14:00 till 17:00 May 1)
  - The accumulated water (about 220m<sup>3</sup>) was transferred from the basement of the turbine building of Unit 6 to a temporary tank. (From 10:00 till 16:00 May 2)
  - Due to the testing of the starter transformers (5SB) in Units 5 and 6 for power reception, the pumps for the Residual Heat Removal System (RHR) were temporarily shut off. (May 2, From 13:30 till 15:03 for Unit 5 and from 11:03 to 14:53 for Unit 6.)
  - The transfer of accumulated water (about 114m<sup>3</sup>) from the basement of the turbine building of Unit 6 to a temporary tank was carried out. (From 14:00 till 17:00 May 3)
  - The transfer of the accumulated water (about 600m<sup>3</sup>) from the

basement of the turbine building of Unit 5 to the Condenser was carried out. (From March 27 till May 2)

- The accumulated water (about 120m<sup>3</sup>) in the basement of the turbine building of Unit 6 was transferred to the temporary tank. (From 14:00 till 17:00 May 6)
- The transfer of the accumulated water from the basement of the turbine building of Unit 6 to the temporary tank was started. (From 10:00 May 7)

#### <Common Spent Fuel Pool>

- It was confirmed just after 06:00 March 18 that the water level of the Spent Fuel Pool was almost full.
- Water was injected into the Common Spent Fuel Pool. (From 10:37 till 15:30 March 21)
- Power started to be supplied (15:37 March 24) and cooling also started.(18:05 March 24)
- The power supply was stopped due to short-circuit at the terminal portion of the power supply circuit. (14:34 April 17) Thereafter the facility was inspected and the power supply was restored. (17:30 April 17)
- As of 08:00 May 7, the water temperature of the pool was about 25°C.

#### <Seawater and Soil Monitoring>

- As a result of a nuclide analysis of seawater from around the Southern Water Discharge Canal,  $7.4 \times 10^1 \text{Bq/cm}^3$  of <sup>131</sup>I (Iodine) was detected (1,850.5 times higher than the water concentration limit for areas outside the Environmental Monitoring Area). (14:30 March 26)  
(As a result of measurement on 29 March, the level was 3,355.0 times higher than the water concentration limit. (13:55 March 29). On the other hand, as a result of a nuclide analysis of seawater from the northern side of the Water Discharge Canal of the NPS,  $4.6 \times 10^1 \text{Bq/cm}^3$  of <sup>131</sup>I (Iodine) was detected (1,262.5 times higher than the water concentration limit). (14:10 March 29)
- In the samples of soil collected on March 21 and 22 on the site of Fukushima Dai-ichi NPS (from 5 points), <sup>238</sup>Pu (Plutonium), <sup>239</sup>Pu (Plutonium) and <sup>240</sup>Pu (Plutonium) were detected (23:45 March 28)

announcement by TEPCO). The concentration level of the detected plutonium was equivalent to the level of the fallout (radioactive fallout) observed in Japan in connection with atmospheric nuclear tests in the past, i.e., equivalent to normal environmental levels, and it did not pose any harm to human health.

- Permanent monitoring posts (No.1 to 8) installed near the Site Boundary were restored. (March 31) Measurements will be made once a day.
- In the samples of soil (7 samples in total) collected on March 25 (from 4 points) and March 28 (from 3 points) from the site of Fukushima Dai-ichi NPS,  $^{238}\text{Pu}$  (Plutonium),  $^{239}\text{Pu}$  (Plutonium) and  $^{240}\text{Pu}$  (Plutonium) were detected (announcement by TEPCO, 18:30 April 6). The concentration of the detected plutonium was, similar to the previous finding (announcement on March 28), equivalent to the level of the fallout (radioactive fallout) observed in Japan in connection with atmospheric nuclear tests in the past, i.e., equivalent to normal environmental levels, and it did not pose any harm to human health.
- As a result of a nuclide analysis of seawater from around the Southern Water Discharge Canal,  $1.8 \times 10^2 \text{Bq/cm}^3$  of  $^{131}\text{I}$  (Iodine) was detected (4,385.0 times higher than the water concentration limit outside the Environmental Monitoring Area) (13:55 March 30).
- In the 3 soil samples (of a total of 6 samples) collected on March 31 and April 4 from 3 points on the site of Fukushima Dai-ichi NPS, designated for regular sampling,  $^{238}\text{Pu}$  (Plutonium),  $^{239}\text{Pu}$  (Plutonium) and  $^{240}\text{Pu}$  (Plutonium) were detected (announcement by TEPCO, 18:30 April 14). The concentration of the detected plutonium was equivalent to the level of the fallout (radioactive fallout) observed in Japan in connection with atmospheric nuclear tests in the past, i.e., equivalent to normal environmental levels, and it did not pose any harm to human health.

#### <Prevention of Diffusion of Contaminated Water>

- In order to prevent any flow of contaminated water from the exclusive port to the sea, large-sized sandbags were placed around the seawall on the south side of the NPS. (From 15:00 till 16:30 April 5)
- The installation of a double row of silt fences was completed near the seawall on the south side of the NPS to prevent the diffusion of contaminated water. (10:45 April 11)

- On the ocean-side of the Inlet Bar Screen of Unit 2, a temporary board to stop water (one of 7 steel plates) was installed. (From 12:00 till 13:00 April 12)
- On the ocean-side of the Inlet Bar Screen of Unit 2, temporary boards to stop water (2 of 7 steel plates) were installed. (From around 8:30 till around 10:00 April 13)
- Silt fences to prevent the diffusion of contaminated water were installed in front of the screens of Units 3 and 4. (13:50 April 13)
- Silt fences to prevent the diffusion of contaminated water were installed at the Curtain Wall and in front of the screens of Units 1 and 2. (12:20 April 14)
- 3 sandbags filled with Zeolite were placed between the Inlet Screen Pump Room of Unit 3 and the Inlet Screen Pump Room of Unit 4. (From 14:30 till 15:45 April 15)
- Temporary boards to stop water (4 of 7 steel plates) were installed on the ocean-side of the Inlet Bar Screen of Unit 2. (From 9:00 till 14:15 April 15)
- 2 sandbags filled with Zeolite were placed between the Inlet Screen Pump Room of Unit 1 and the Inlet Screen Pump Room of Unit 2, and 5 sandbags filled with Zeolite were placed between the Inlet Screen Pump Room of Unit 2 and the Inlet Screen Pump Room of Unit 3. (From 9:00 till 11:15 April 17)

## <Spraying of an Anti-scattering Agent to Prevent the Spread of Radioactive Materials>

- Spraying was carried out by workers on a trial basis in an area of about 500m<sup>2</sup> on the mountain-side of the Common Pool. (From 15:00 till 16:05 April 1)
- Spraying was carried out by workers on a trial basis in an area of about 600m<sup>2</sup> on the mountain-side of the Common Pool and on the west and south sides of Unit 4. (From 13:00 till 16:30 April 5)
- Spraying was carried out by workers on a trial basis in an area of about 600m<sup>2</sup> on the mountain-side of the Common Pool. (From 12:30 till 14:30 April 6)
- Spraying was carried out by workers on a trial basis in an area of about 680m<sup>2</sup> on the mountain-side of the Common Pool. (From 11:00 till 14:00 April 6)

- April 8)
- Spraying was carried out by workers on a trial basis in an area of about 550m<sup>2</sup> on the mountain-side of the Common Pool. (From 13:00 till 14:00 April 10)
  - Spraying was carried out by workers on a trial basis in an area of about 1,200m<sup>2</sup> on the mountain-side of the Common Pool. (From 12:00 till 13:00 April 11)
  - Spraying was carried out by workers on a trial basis in an area of about 700m<sup>2</sup> on the mountain-side of the Common Pool. (From 12:00 till 13:00 April 12)
  - Spraying was carried out by workers on a trial basis in an area of about 400m<sup>2</sup> on the mountain-side of the Common Pool. (From 11:00 till 11:30 April 13)
  - Spraying was carried out by workers on a trial basis in an area of about 1,600m<sup>2</sup> on the mountain-side of the Common Pool. (From 12:00 till 13:30 April 14)
  - Spraying was carried out by workers on a trial basis in an area of about 1,900m<sup>2</sup> on the mountain-side of the Common Pool. (From 11:30 till 13:00 April 15)
  - Spraying was carried out by workers on a trial basis in an area of about 1,800m<sup>2</sup> that includes the mountain-side of the Surge Tank of the Suppression Pool Water. (From 11:00 till 13:00 April 16)
  - Spraying was carried out by workers on a trial basis in an area of about 1,900m<sup>2</sup> around the Radioactive Waste Treatment Facilities. (From 10:00 till 13:30 April 17)
  - Spraying was carried out by workers on a trial basis in an area of about 1200m<sup>2</sup> around the Radioactive Waste Treatment Facilities. (From 09:00 till 14:30 April 18)
  - Spraying was carried out by workers on a trial basis in an area of about 1,900m<sup>2</sup> that includes the Radioactive Waste Treatment Facilities (From 12:00 till 13:30 April 20)
  - Spraying was carried out by workers on a trial basis in an area of about 1,300m<sup>2</sup> on the mountain-side of the Radioactive Waste Treatment Facilities and about 5,100m<sup>2</sup> on the mountain-side of the switchyard for the high-voltage power supply of Units 5 and 6. (From 12:00 till 15:00 April 21)



- Spraying was carried out by workers on a trial basis in an area of about 860 m<sup>2</sup> on the mountain-side of the Nuclear Reactor Building for Unit 5. (From 11:30 till 13:00 April 24)
- Spraying was carried out by workers on a trial basis in an area of about 3,800m<sup>2</sup> on the mountain-side of the reactor building of Unit 5, on the road in front of the former Main Office Building, and around the gymnasium. (From 10:30 till 12:30 April 25)
- Spraying was carried out on a full scale in an area of about 5,000m<sup>2</sup> on the ocean-side of the turbine building of Unit 3 using an unmanned crawler dump. (From 13:30 till 17:00 April 26)
- Spraying was carried out on a full scale in an area of about 7,500m<sup>2</sup> on the ocean-side of the turbine building of Unit 3 using an unmanned crawler dump. (From 11:00 till 17:00 April 27)
- Spraying was carried out by workers on a full scale in an area of about 4,540m<sup>2</sup> on the mountain-side of the reactor building of Unit 5, the road in front of the former Main Office Building and around the gymnasium. (From 10:30 till 12:00 April 28)
- Spraying was carried out on a full scale in an area of about 7,000m<sup>2</sup> on the ocean-side of the turbine building of Unit 4 using an unmanned crawler dump. (From 09:00 till 16:00 April 29)
- Spraying was carried out on a full scale by workers in an area of about 5,800m<sup>2</sup> on the mountain-side of the reactor building of Unit 5, the road in front of the former Main Office Building and around the gymnasium. (From 10:30 till 14:00 April 29)
- Spraying was carried out on a full-scale in an area of about 2,000m<sup>2</sup> on the south-side of the turbine building of Unit 4 using an unmanned crawler dump. (From 11:00 till 14:00 April 30)
- Spraying was carried out by workers on a full-scale in an area of about 5,400m<sup>2</sup> on the road in front of the former Main Office Building, near the gymnasium and on the west-side of the shallow draft quay. (From 10:30 till 14:00 April 30)
- Spraying was carried out on a full-scale in an area of about 1,000m<sup>2</sup> on the south-side of the reactor building of Unit 4 using an unmanned crawler dump. (From 11:00 till 13:00 May 1)
- Spraying was carried out by workers on a full-scale in an area of about 4,400m<sup>2</sup> on the road in front of the former Main Office Building, around

the gymnasium, and on the west-side of the shallow draft quay. (From 10:30 till 14:00 May 1)

- Spraying was carried out on a full scale in an area of about 4,000m<sup>2</sup> on the south-side and west-side of the reactor building of Unit 4 using an unmanned crawler dump. (From 09:00 till 16:00 May 2)
- Spraying was carried out by workers on a full scale in an area of about 5,500m<sup>2</sup> on the road in front of the former Main Office Building, around the gymnasium (sports ground), and on the west-side of the shallow draft quay. (From 10:30 till 14:00 May 2)
- Spraying was carried out by workers on a full scale in an area of about 5,300m<sup>2</sup> on the road in front of the former Main Office Building, on the sports ground, and on the west-side of the shallow draft quay. (From 9:30 till 14:30 May 3)
- Spraying was carried out on a full scale in an area of about 4,000m<sup>2</sup> on the west-side of the reactor building of Unit 3 using an unmanned crawler dump. (From 11:00 till 13:30 May 3)
- Spraying was carried out on a full scale by workers in an area of about 5,200m<sup>2</sup> on the road in front of the former Main Office Building, on the sports ground, and on the west-side of the shallow draft quay. (From 10:30 till 14:00 May 4)
- Spraying was carried out on a full scale by workers in an area of about 4,000m<sup>2</sup> on the west-side of the reactor building of Unit 3 using an unmanned crawler dump. (From 14:00 till 16:00 May 4)
- Spraying was carried out on a full scale by workers in an area of about 5,350m<sup>2</sup> on the west-side of the common pool, on the sports ground, and on the west-side of the shallow draft quay. (From 10:30 till 14:00 May 5)
- Spraying was carried out on a full scale in an area of about 4,000m<sup>2</sup> on the west-side of the reactor building of Unit 2 using an unmanned crawler dump. (From 13:00 till 16:00 May 5)
- Spraying was carried out on a full scale by workers in an area of about 5,200m<sup>2</sup> on the west-side of the shallow draft quay, around the Radioactive Waste Treatment Facilities, and on the sports ground. (From 10:30 till 14:00 May 6)
- Spraying was carried out on a full scale in an area of about 4,000m<sup>2</sup> on the west-side of the reactor building of Unit 1 using an unmanned crawler dump. (From 11:00 till 14:00 May 6)

## <Situation of Removal of Rubble Using Remote-Controlled Heavy Machinery>

- April 10
- From 11:00 till 16:10 April 13 (an amount equivalent to 6 containers)
- From 09:00 till 15:45 April 15 (an amount equivalent to 1 container)
- From 09:00 till 16:00 April 16 (an amount equivalent to 8 containers)
- From 09:00 till 16:00 April 17 (an amount equivalent to 2 containers)
- From 09:00 till 16:00 April 18 (an amount equivalent to 4 containers)
- From 09:00 till 15:00 April 19 (an amount equivalent to 3 containers)
- From 09:00 till 16:00 April 20 (an amount equivalent to 1 container)
- From 09:00 till 16:00 April 21 (an amount equivalent to 1 container)
- From 09:00 till 16:00 April 22 (an amount equivalent to 2 containers)
- From 09:00 till 16:00 April 24 (an amount equivalent to 3 containers)
- From 09:00 till 16:00 April 25 (an amount equivalent to 4 containers)
- From 09:00 till 16:00 April 26 (an amount equivalent to 2 containers)
- From 09:00 till 16:00 April 27 (an amount equivalent to 3 containers)
- From 09:00 till 16:00 April 28 (an amount equivalent to 4 containers)
- From 09:00 till 16:00 April 29 (an amount equivalent to 4 containers)
- From 09:15 till 16:15 April 30 (an amount equivalent to 4 containers)
- From 09:00 till 16:15 May 1 (an amount equivalent to 4 containers)
- From 09:00 till 16:00 May 2 (an amount equivalent to 6 containers)
- From 09:00 till 16:00 May 3 (an amount equivalent to 2 containers)
- From 09:00 till 16:00 May 4 (an amount equivalent to 5 containers)
- From 09:00 till 16:00 May 5 (an amount equivalent to 4 containers)
- From 09:00 till 16:00 May 6 (an amount equivalent to 7 containers)

## <Others>

- Accumulated water was found in the vertical shafts of trenches (underground structures for laying pipes, shaped like tunnels) located outside the turbine buildings of Units 1 to 3. The dose rates at the surface of the water were 0.4mSv/h in the trench of Unit 1 and 1,000mSv/h in the trench of Unit 2. The dose rate of Unit 3 could not be measured due to rubble. (Around 15:30 March 27) The accumulated water in the vertical shaft of Unit 1 was transferred to the storage tank in the Main Building of the Radioactive Waste Treatment Facilities

- using a temporary pump, which reduced the water level from approximately -0.14m to approximately -1.14m from the top of the shaft. (From 09:20 till 11:25 March 31)
- When removing a flange of a pipe in the RHRS outside the building of Unit 3, three subcontractor's employees spilled water on themselves with water remaining in the pipe. However, as a result of wiping the water off, no radioactive materials were attached to their bodies. (12:03 March 29)
  - On March 28, accumulated water was found in the Main Building of the Radioactive Waste Treatment Facilities. On March 29, as a result of a radioactivity analysis, the total amount of radioactivity detected was  $1.2 \times 10^1$  Bq/cm<sup>3</sup> in the controlled area and  $2.2 \times 10^1$  Bq/cm<sup>3</sup> in the non-controlled area.
  - A barge from the U.S. Forces, Japan (USFJ) carrying fresh water for cooling reactors, etc. (the first ship), was towed to and brought along the shore in an exclusive port of Fukushima Dai-ichi NPS by the Maritime Self-Defense Force vessels. (15:42 March 31) The transfer of fresh water from the barge (the first ship) to the Filtrate Tank was started. (15:58 April 1) Subsequently, it was suspended due to a malfunction of a hose (16:25 April 1), but injection resumed on April 2. (From 10:20 till 16:40 April 2)
  - The second USFJ barge (the second ship) carrying fresh water for cooling reactors, etc., was towed to and was brought alongside the shore in the exclusive port of Fukushima Dai-ichi NPS by the Maritime Self-Defense Force vessels. (09:10 April 2)
  - The freshwater was transferred from one USFJ barge (the second ship) to the other barge (the first ship). (From 09:52 till 11:15 April 3)
  - Discharge of accumulated water with low-level radioactivity in the Main Building of the Radioactive Waste Treatment Facilities was started. It was discharged from the southern side of the Water Discharge Canal into the sea using the first pump. (19:03 April 4) The discharge was further carried out using 10 pumps in total (19:07 April 4) and then discharge into the sea using submersible pumps was suspended at 17:40 April 10. Confirmation of how much water is remaining is being carried out. (Total amount of discharged water was about 9,070t.)
  - The accumulated water with low-level radioactivity in the Building of the

- Miscellaneous Solid Waste Volume Reduction Facilities was discharged from the southern side of the Water Discharge Canal to the sea using 5 pumps.(From 17:20 April 6 till 18:20 April 7)
- In order to prepare for the transfer of the accumulated water from the turbine buildings to the Radioactive Waste Treatment Facilities, holes were drilled into the outer walls of the turbine buildings of Units 2 to 4. (April 7)
  - Discharge of water in the Radioactive Waste Treatment Facilities was resumed after it was suspended due to an earthquake off the coast of Miyagi Prefecture that occurred at 11:32 April 7. (14:30 April 8)
  - Video shots using an unmanned helicopter were taken in order to grasp the situation of reactor buildings of Units 1 to 4. (From 15:59 till 16:28 April 10)
  - It was confirmed that a fire broke out at the Water Discharge Canal Sampling Building for Units 1 to 4. (Around 6:38 April 12) As a result of immediate fire fighting activities, it was confirmed that there was no more fire or smoke. (Just before 07:00 on the same day) Later, it was confirmed that the fire was completely extinguished. (09:12 on the same day)
  - Video shots were taken using an unmanned helicopter in order to grasp the situation of the reactor buildings of Units 3 and 4. (From 10:17 till 12:25 April 14)
  - Video shots using an unmanned helicopter was carried out in order to grasp the situation of the reactor buildings of Units 1 to 4. (From 08:02 till 09:55 April 15)
  - As a countermeasure against tsunami, distribution panels, etc. of pumps to inject water into the reactors of Units 1 to 3 were transferred to a hill. (From 10:19 till 17:00 April 15)
  - Measures to ensure that buildings of the Radioactive Waste Treatment Facilities are watertight were completed. (April 18)
  - The work of strengthening the interconnection of the power supplies between Units 1 and 2 and Units 3 and 4 was completed. (10:23 April 19)
  - Video shots were taken using an unmanned helicopter in order to grasp the situation of the reactor buildings of Units 1 to 4 (11:43-12:50 April 21)
  - The reinforcement work on the external power supplies (the power supply

connection between Units 1 and 2, and Units 5 and 6) were carried out.  
(From 14:44 till 17:38 April 25)

- The reinforcement work on the power supplies for Units 3 and 4 (voltage increase from 6.6kv to 66kv) was completed. (11:34 April 30)

● Fukushima Dai-ni NPS (TEPCO)

(Naraha Town / Tomioka Town, Futaba County, Fukushima Prefecture.)

(1) Operating Status

- Unit 1 (1,100MWe): automatic shutdown, cold shut down at 17:00, March 14
- Unit 2 (1,100MWe): automatic shutdown, cold shut down at 18:00, March 14
- Unit 3 (1,100MWe): automatic shutdown, cold shut down at 12:15, March 12
- Unit 4 (1,100MWe): automatic shutdown, cold shut down at 07:15, March 15

(2) Major Plant Parameters (As of 12:00 May 7)

	Unit	Unit 1 (cold shutdown)	Unit 2 (cold shutdown)	Unit 3 (cold shutdown)	Unit 4 (cold shutdown)
Reactor Pressure*1	MPa	0.16	0.13	0.10	0.17
Reactor water temperature	°C	24.6	25.2	28.0	27.0
Reactor water level*2	Mm	9,446	10,246	7,249	8,785
Suppression pool water temperature	°C	24	25	26	28
Suppression pool pressure	kPa (abs)	108	107	110	103
Remarks (Data sampling time)		12:00 May 7	12:00 May 7	12:00 May 7	12:00 May 7

\*1: Converted from reading value to absolute pressure

\*2: Distance from the top of fuel

(3) Situation of Each Unit

<Unit 1>

- Around 17:56 March 30, smoke was rising from the power distribution panel on the first floor of the turbine building of Unit 1. However, when

the power supply was turned off, the smoke emission stopped. It was judged by the fire station at 19:15 that this event was caused by the malfunction of the power distribution panel and was not a fire.

- The RHR (B) to cool the reactor of Unit 1 started to receive power from an emergency power supply in addition to an external power supply. This resulted in securing the backup power supplies (emergency power supplies) for the RHR (B) for all Units. (14:30 March 30)

#### (4) Report Concerning Other Incidents

- TEPCO reported to NISA the event falling under Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 1. (18:08 March 11)
- TEPCO reported to NISA the events falling under Article 10 regarding Units 1, 2 and 4. (18:33 March 11)
- TEPCO reported to NISA the event (Loss of Pressure Suppression Functions) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 1. (5:22 March 12)
- TEPCO reported to NISA the event (Loss of Pressure Suppression Functions) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 2. (5:32 March 12)
- TEPCO reported to NISA the event (Loss of Pressure Suppression Functions) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 4 of Fukushima Dai-ni NPS. (6:07 March 12)

- Onagawa NPS (Tohoku Electric Power Co. Inc.)

(Onagawa Town, Oga County and Ishinomaki City, Miyagi Prefecture)

#### (1) Operating Status

Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12

Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake

Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12

## (2) Readings of Monitoring Post, etc.

MP2 (Monitoring at the Northern End of Site Boundary)

Approx.  $0.24 \mu$  SV/h (16:00 May 2) (Approx.  $0.25 \mu$  SV/h (14:50 May 1))

## (3) Report Concerning Other Incidents

- It was confirmed that the smoke emission on the first basement of the Turbine Building was extinguished. (22:55 on March 11)
- Tohoku Electric Power Co. reported to NISA the event falling under Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:09 March 13)

## 2. Actions Taken by NISA

(March 11)

14:46 The NISA Emergency Preparedness Headquarters (Tokyo) was set up immediately after the earthquake

15:42 TEPCO reported to NISA the event falling under Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.

16:36 TEPCO recognized the event (Inability of Water Injection of the Emergency Core Cooling System) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Units 1 and 2 of Fukushima Dai-ichi NPS. (Reported to NISA at 16:45)

18:08 Regarding Unit 1 of Fukushima Dai-ichi NPS, TEPCO reported to NISA the event falling under Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

18:33 Regarding Units 1, 2 and 4 of Fukushima Dai-ichi NPS, TEPCO reported to NISA the event falling under Article 10 of Act on Special Measures Concerning Nuclear Emergency Preparedness.

19:03 The Government declared the state of nuclear emergency. (Establishment of the Government Nuclear Emergency Response Headquarters and the Local Nuclear Emergency Response Headquarters)

20:50 Fukushima Prefecture's Emergency Response Headquarters issued an instruction to evacuate for the residents within 2 km radius from Unit 1 of Fukushima Dai-ichi NPS. (The population of this area is



1,864.)

21:23 The following instructions from the Prime Minister to the Governor of Fukushima Prefecture, the Mayor of Okuma Town and the Mayor of Futaba Town were issued regarding the event that occurred at Fukushima Dai-ichi NPS, TEPCO, pursuant to Article 15, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness:

- An instruction to evacuate for residents within 3km radius from Unit 1 of Fukushima Dai-ichi NPS
- An instruction to stay in-house for residents within 10km radius from Unit 1 of Fukushima Dai-ichi NPS

24:00 Vice Minister of Economy, Trade and Industry, Ikeda arrived at the Local Nuclear Emergency Response Headquarters

(March12)

0:49 Regarding Units 1 of TEPCO Fukushima Dai-ichi NPS, TEPCO recognized the event (Unusual Rise of the Pressure in the PCV) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (Reported to NISA at 01:20)

05:22 Regarding Unit 1 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of Pressure Suppression Function) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (Reported to NISA at 06:27)

05:32 Regarding Unit 2 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of Pressure Suppression Function) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

05:44 The Prime Minister instructed residents within 10km radius from Unit 1 of Fukushima Dai-ichi NPS to evacuate.

06:07 Regarding Unit 4 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of pressure suppression function) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

06:50 Pursuant to Article 64, paragraph 3 of the Nuclear Regulation Act, an order was issued by the Minister of Economy, Trade and Industry to control the internal pressure of the PCV of Units 1 and 2 of

Fukushima Dai-ichi NPS.

07:45 The following instructions were issued from the Prime Minister to the Governor of Fukushima Prefecture, the Mayors of Hirono Town, Naraha Town, Tomioka Town and Okuma Town regarding the event that occurred at Fukushima Dai-ichi NPS, TEPCO, pursuant to Article 15, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

- An instruction to evacuate for residents within 3km radius from Fukushima Dai-ichi NPS
- An instruction to stay in-house for residents within 10km radius from Fukushima Dai-ichi NPS

17:00 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

17:39 The Prime Minister instructed the evacuation of the residents within the 10 km radius from Fukushima Dai-ichi NPS.

18:25 The Prime Minister instructed the evacuation of the residents within the 20km radius from Fukushima Dai-ichi NPS.

19:55 An instruction from the Prime Minister was issued regarding seawater injection into Unit 1 of Fukushima Dai-ichi NPS.

20:05 Based on the instruction from the Prime Minister, and pursuant to Article 64, paragraph 3 of the Nuclear Regulation Act, an order was issued by the Minister of Economy, Trade and Industry to inject seawater into Unit 1 of Fukushima Dai-ichi NPS and so on.

20:20 At Unit 1 of Fukushima Dai-ichi NPS, seawater injection was started.

(March 13)

05:38 TEPCO reported to NISA the event (Total Loss of Coolant Injection Function) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Unit 3 of Fukushima Dai-ichi NPS. Recovery efforts by TEPCO for the power supply and coolant injection functions, as well as the work on venting are underway.

09:01 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on

Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.

- 09:08 Pressure suppression and fresh water injection was started for Unit 3 of Fukushima Dai-ichi NPS.
- 09:20 The Pressure Vent Valve of Unit 3 of Fukushima Dai-ichi NPS was opened.
- 09:30 An instruction was issued to the Governor of Fukushima Prefecture, the Mayors of Okuma Town, Futaba Town, Tomioka Town and Namie Town, pursuant to the Act on Special Measures Concerning Nuclear Emergency Preparedness, with regard to the contents of radioactivity decontamination screening.
- 13:09 Tohoku Electric Power Co. reported to NISA that Onagawa NPS reached a situation falling under Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.
- 13:12 Fresh water injection was switched to seawater injection for Unit 3 of Fukushima Dai-ichi NPS.
- 14:36 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.

(March 14)

- 01:10 Seawater injection for Units 1 and 3 of Fukushima Dai-ichi NPS were temporarily interrupted due to the lack of seawater in the pit.
- 03:20 Seawater injection for Unit 3 of Fukushima Dai-ichi NPS was resumed.
- 04:40 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.
- 05:38 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.
- 07:52 TEPCO reported to NISA the event (Unusual Rise of the Pressure in the PCV) falling under Article 15 of the Act on Special Measures

Concerning Nuclear Emergency Preparedness, regarding Unit 3 of Fukushima Dai-ichi NPS.

13:25 Regarding Unit 2 of Fukushima Dai-ichi NPS, TEPCO recognised the event (Loss of Reactor Cooling Function) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

22:13 TEPCO reported to NISA, pursuant to Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ni NPS.

22:35 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.

(March 15)

00:00: The acceptance of experts from International Atomic Energy Agency (IAEA) was decided. NISA agreed to accept the offer of dispatching the expert on NPS damages from IAEA, considering the intention by Mr. Amano, Director General of IAEA. Therefore, the schedule of expert acceptance will be planned from now on according to the situation.

00:00: NISA also decided to accept the experts dispatched from U.S. Nuclear Regulatory Commission (NRC).

07:21 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.

07:24 The Incorporated Administration Agency, Japan Atomic Energy Agency (JAEA) reported to NISA, pursuant to Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Nuclear Fuel Cycle Engineering Laboratories, Tokai Research and Development Centre.

07:44 JAEA reported to NISA, pursuant to Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Nuclear Science Research Institute.

08:54 TEPCO reported to NISA the event (Unusual Increase of Radiation

- Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.
- 10:30 Pursuant to Article 64, paragraph 3 of the Nuclear Regulation Act, the Minister of Economy, Trade and Industry issued the following orders:
- For Unit 4: To extinguish fire and to prevent the occurrence of re-criticality
  - For Unit 2: To inject water into the reactor vessel promptly and to vent the Drywell.
- 10:59 In consideration of the possibility of the situation becoming prolonged, it was decided that the function of the Local Nuclear Emergency Response Headquarters be moved to the Fukushima Prefectural Office.
- 11:00 The Prime Minister instructed the in-house stay area.  
In-house stay was additionally instructed to the residents in the area from 20km to 30km radius from Fukushima Dai-ichi NPS, considering the in-reactor situation.
- 16:30 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.
- 22:00 Pursuant to Article 64, paragraph 3 of the Nuclear Regulation Act, the Minister of Economy, Trade and Industry issued the following order:
- For Unit 4: To implement the water injection into the Spent Fuel Pool.
- 23:46 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.
- (March 18)
- 13:00 Ministry of Education, Culture, Sports, Science and Technology decided to reinforce the nation-wide monitoring survey in the emergency situation of Fukushima Dai-ichi and Dai-ni NPS.

15:55 TEPCO reported to NISA on the accidents and failures at Units 1, 2, 3 and 4 of Fukushima Dai-ichi NPS (Leakage of the Radioactive Materials Inside of the Reactor Buildings to Non-controlled Areas of Radiation) falling under Article 62-3 of the Nuclear Regulation Act.

16:48 Japan Atomic Power Co. reported to NISA accidents and failures in Tokai NPS (Failure of the Seawater Pump Motor of the Emergency Diesel Generator 2C) falling under Article 62-3 of the Nuclear Regulation Act.

(March 19)

07:44 The second unit of the Emergency Diesel Generator (A) for Unit 6 started up.

TEPCO reported to NISA that the RHR pump (C) for Unit 5 started up and started to cool the Spent Fuel Storage Pool. (Power supply: Emergency Diesel Generator for Unit 6)

08:58 TEPCO reported to NISA the event (Unusual Increase of Radiation Dose at the Site Boundary) falling under Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, regarding Fukushima Dai-ichi NPS.

(March 20)

23:30 An instruction from the Local Nuclear Emergency Response Headquarters to the Prefectural Governor and the Heads of cities, towns and villages (Tomioka Town, Futaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisoma City, Tamura City, Katsurao Village, Hirono Town, Iwaki City and Iitate Village) was issued regarding the change of the reference value for the screening level for decontamination of radioactivity.

(March 21)

07:45 An instruction titled “Administration of Stable Iodine” was issued from the Local Nuclear Emergency Response Headquarters to the Prefectural Governor and the Heads of cities, towns and villages (Tomioka Town, Futaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Katsurao Village, Hirono Town, Iwaki City and Iitate Village), which instructs

the above-mentioned Governor and the Heads to administer stable iodine under the direction of the Headquarters and in the presence of medical experts, and not to administer it based on personal judgements.

16:45 An instruction titled “Ventilation for Using Heating Equipments Within the In-house Evacuation Zone” was issued from the Director-General of the Local Nuclear Emergency Response Headquarters to the Prefectural Governor and the Heads of cities, towns and villages (Iwaki City, Tamura City, Minamisouma City, Hirono Town, Kawauchi Village, Namie Town, Katsurao Village and Iitate Village), which instructs the above-mentioned Governor and Heads to publicly announce the guidance to the residents within the in-house evacuation zone, concerning the indoor use of heating equipments that require ventilation, in order to avoid poisoning from carbon monoxide and to reduce exposure.

17:50 An instruction from the Director-General of the Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi and Gunma was issued, which instructs the above-mentioned Governors to issue a request to relevant businesses and people to suspend shipment of spinach, *Kakina* (a green vegetable) and raw milk for the time being.

(March 22)

16:00 NISA received a response (advice) from the Nuclear Safety Commission Emergency Technical Advisory Body to the request for advice made by NISA, regarding the report from TEPCO titled “The Results of Analysis of Seawater” dated March 22.

(March 25)

NISA directed TEPCO orally, regarding the exposure of workers at the turbine building of Unit 3 of Fukushima Dai-ichi Nuclear Power Station that occurred on March 24, to immediately review and to improve radiation control measures from the viewpoint of preventing a recurrence.

(March 28)

Regarding the error in the evaluation of the concentration measurement in the accumulated water on the basement floor of the turbine building of Unit 2 of Fukushima Dai-ichi NPS, that was announced by TEPCO on 27 March, NISA directed TEPCO orally to prevent the recurrence of such a mistake.

13:50 Receiving the suggestion by the special meeting of Nuclear Safety Commission (NSC) (accumulated water on the underground floor of the turbine building at Fukushima Dai-ichi Plant Unit 2), NISA directed TEPCO orally to add the sea water monitoring points and carry out the groundwater monitoring.

Regarding the delay in the reporting of the water confirmed outside of the turbine buildings, NISA directed TEPCO to carry out communications in the company on significant information in a timely manner and to report it in a timely and appropriate manner.

(March 29)

11:16 The report was received, regarding the accident and trouble etc., in Onagawa NPS of Tohoku Electric Power Co. Inc. (the trouble of pump of component cooling water system etc., in Unit 2 and the fall of heavy oil tank for auxiliary boiler of Unit 1 by tsunami), pursuant to Article 62-3 of the Nuclear Regulation Act and Article 3 of the Ministerial Ordinance for the Reports related to Electricity.

In order to strengthen the system to assist the nuclear accident sufferers, the "Nuclear Sufferers' Life Support Team" headed by the Minister of Economy, Trade and Industry was established and the visits, etc., by the team to relevant cities, towns and villages were carried out.

The Local Nuclear Emergency Response Headquarters issued the News Letter No.1 for the residents within the area from 20km to 30km radius.

(March 30)

Directions as to the implementation of the emergency safety measures for the other power stations considering the accident of Fukushima Dai-ichi and Dai-ni NPSs in 2011 were issued and handed to each electric power company and the relevant organization.



(March 31)

Regarding the break-in of the propaganda vehicle to Fukushima Dai-ni NPS on 31 March, NISA directed TEPCO orally to take the carefully thought-out measures regarding physical protection, etc.

NISA alerted TEPCO to take carefully thought-out measures regarding radiation control for workers.

The Local Nuclear Emergency Response Headquarters issued the News Letter No.2 for the residents within the area from 20km to 30km radius.

(April 1)

NISA strictly alerted TEPCO to take appropriate measures concerning the following three matters regarding the error in the results of the nuclide analysis.

- Regarding the past evaluation results on nuclide analysis, all the nuclides erroneously evaluated should be identified and the re-evaluation on them should be promptly carried out.
- The causes for the erroneous evaluation should be investigated and thorough measures for preventing the recurrence should be taken.
- Immediate notification should be done in the stage when any erroneous evaluation results, etc. are identified.

(April 2)

Regarding the outflow of the liquid containing radioactive materials from the area around the Intake Channel of Unit 2 of Fukushima Dai-ichi NPS, NISA directed TEPCO orally to carry out nuclide analysis of the liquid sampled, to confirm whether there are other outflows from the same parts of the facilities as the one from which the outflow was confirmed around Unit 2, and to strengthen monitoring through sampling water at more points around the facilities concerned.

(April 4)

On the imperative execution of the discharge to the sea as an emergency measure, NISA requested the technical advice of NSC and directed TEPCO to survey and confirm the impact of the spread of radioactive materials caused by the discharge, by ensuring continuity of the sea monitoring currently underway and enhancing it (increase of the frequency of measuring as well as the number of monitoring points), disclose required information, as well as to enhance the strategy to minimize the discharge amount.

(April 5)

Directions were issued as to the implementation of advance notification and contact to the local governments with regard to taking measures related to discharge of radioactive materials from Fukushima Dai-ichi NPS, which have a possible impact on the environment.

(April 6)

On the implementation of the nitrogen injection into the PCV of Unit 1, NISA directed TEPCO on the following three points. (12:40 April 6) 1. Properly control the plant parameters, and take measures appropriately to ensure safety in response to changes in the parameters. 2. Establish and implement an organizational structure and so on that will ensure the safety of the workers who will engage in the operation. 3. As the possibility of leakage of the air in the PCV to the outside due to the nitrogen injection cannot be ruled out, through the judicious and further enhanced monitoring, TEPCO shall survey and confirm the impact of the release and spreading of radioactive materials due to the nitrogen injection, and strive to disclose information.

(April 7)

The Local Nuclear Emergency Response Headquarters issued the News Letter No.3 for the residents within the area from 20km to 30km radius. (April 7)

(April 9)

Due to the earthquake off the coast of Miyagi Prefecture that occurred around 23:32 April 7, all the Emergency Diesel Generators for Unit 1 of the Higashidori NPS of Tohoku Electric Power Co., Inc. were not workable. Considering this event, NISA issued the letters of direction titled "Regarding the Treatment of Emergency Power Generating Facilities in Terms of Safety Regulations (Directions)" to each Electricity Utility and other organizations concerned.

Pursuant to Article 67, paragraph 1 of the Nuclear Regulation Act, NISA issued the instruction regarding collection of a report that should include the evaluation of the necessity and safety, and the policy of ensuring the permanent storage and treatment facilities for the waste water and so on, concerning the transfer of the accumulated water with high-level radioactivity in Fukushima Dai-ichi NPS to the Radioactive Waste Treatment Facilities.

(April 10)

Pursuant to Article 67, paragraph 1 of the Nuclear Regulation Act, NISA issued the instruction regarding collection of a report that should include the necessity, the evaluation of safety and the policy of ensuring the permanent storage and treatment facilities for the waste water and so on, concerning the transfer of the accumulated water with high-level radioactivity in Fukushima Dai-ichi NPS to the Radioactive Waste Treatment Facilities.

(April 13)

Pursuant to Article 67, paragraph 1 of the Nuclear Regulation Act, NISA instructed TEPCO to report the result of implementation on seismic safety evaluation as well as the result of consideration on the measurement of effective seismic reinforcement work, etc., regarding the buildings of Fukushima Dai-ichi NPS.

NISA directed TEPCO to implement detailed analysis and consideration regarding the tsunami caused by the 2011 Tohoku District - Off the Pacific Ocean Earthquake.

NISA directed Tohoku Electric Power Co. Inc. to report the analysis of seismic data observed when the 2011 Earthquake Off the Coast of

Miyagi Prefecture occurred around 23:32 on April 7, and the assessment on seismic impact on the facilities that are important from the seismic safety viewpoints.

(April 14)

- NISA directed TEPCO orally to strengthen the monitoring of the Sub Drain (the subsurface water collected and controlled in the facilities) of Units 1 and 2, because the radioactive concentration of the water sampled on April 13 rose one digit in comparison with the preceding result.

(April 15)

- NISA strictly alerted TEPCO and directed it orally to prepare the measures for preventing the recurrence regarding the delay in the notification of the dismissal of Nuclear Emergency Preparedness Manager, accompanied with the personnel changes dated on 1 April, pursuant to Article 9, paragraph 5 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

- NISA directed General Electricity Utilities and other organizations concerned to consider measures to ensure the reliability of the external power supply due to the temporary loss of external power supply at NPSs, etc. caused by ground faults in part of electric power system when the earthquake off the coast of Miyagi Prefecture occurred on April 7, 2011.

(April 18)

- NISA accepted (April 18) and confirmed (April 19) the report from TEPCO, in accordance with the direction for the collection of report issued on 10 April, concerning the transfer of the accumulated water with high-level radioactivity in Fukushima Dai-ichi NPS to the Radioactive Waste Treatment Facilities.

(April 21)

- The Prime Minister issued the following instruction in relation to the accident at Fukushima Dai-ni NPS of TEPCO to the Governor of Fukushima prefecture, and Mayors of Hirono-Town, Naraha-Town,

Tomioka-Town and Okuma-Town, pursuant to the provisions of Article 20, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

- Instruction to change the evacuation area from within 10km radius to within 8km radius from Fukushima Dai-ni NPS.

• The Prime Minister issued the following instruction in relation to the accident at Fukushima Dai-ichi NPS of TEPCO to the Governor of Fukushima prefecture and Mayors or Heads of Tomioka-Town, Futaba-Town, Okuma-Town, Namie-Town, Kawauchi-Village, Naraha-Town, Minamisouma-City, Tamura-City and Katsurao-Village, pursuant to the provisions of Article 20, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

- Instruction to establish a restricted area as the area within 20km radius from Fukushima Dai-ichi NPS, and to prohibit the access to the area or to order to leave the area to any persons other than those engaged in emergency response measures, excluding the case that the mayor of the city or town or the head of the village permits the temporary access.

(April 22)

• The Prime Minister issued the following instruction pertaining to the accident at Fukushima Dai-ichi NPS of TEPCO to the Governor of Fukushima Prefecture and Mayors or Heads of Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Katsurao Village, Hirono Town, Iwaki City, Iitate Village and Kawamata Town, pursuant to Article 20, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

- Instruction to lift the area of in-house stay which had been established for the sphere within 20km to 30km radius from Fukushima Dai-ichi NPS, and to establish Deliberate Evacuation as well as Evacuation-Prepared Areas in Case of Emergency, for the residents and others to make preparations for deliberate leaving, or for evacuation or in-house stay at any time during an emergency, in the subject area.

• The Government Nuclear Emergency Response Headquarters initiated the “Environmental Monitoring Enhancement Plan” to

respond to the following points in order to grasp the entire state of the accident and to evaluate the establishment of deliberate evacuation areas, etc.

- Grasp the scattering situation of radioactive materials within the adequate sphere including the peripheral area of Fukushima Dai-ichi NPS.
- Prepare for future dose assessment and evaluation of the accumulation of radioactive materials in each of the following areas (Evacuation Area, Deliberate Evacuation Area and Evacuation-Prepared Area in Case of Emergency).
- Provide dose information in the environment to evaluate exposure dose of residents, etc., living in the area.

(April 24)

NISA strictly alerted TEPCO orally on the following matters, regarding TEPCO's report that some of the plant data the company provided contained errors.

- These parameters were data that formed the basis of appropriate and prompt actions after the accident, and it is extremely regrettable that the data that was provided contained errors.
- Inspections shall be continued and carried out swiftly and reliably.
- An infallible recurrence prevention measure shall be put in place.

(April 25)

- NISA directed TEPCO to report accident records etc., regarding the accident at Fukushima Dai-ichi NPS, pursuant to Article 67, paragraph 1 of the Nuclear Regulation Act, and Article 106, paragraph 3 of the Electricity Business Act.

(April 27)

- NISA received a report from TEPCO that the effective dose rate from January 1 to March 31, 2011 (4<sup>th</sup> Quarter) of 1 (female) employee who was working after the occurrence of the Tohoku-District-off-the-Pacific-Ocean Earthquake exceeded 5mSv. NISA strictly alerted

TEPCO and directed the company to investigate the cause and to establish measures for preventing a recurrence, as well as to validate the radiation management system in Fukushima Dai-ichi NPS, establish measures based on the validation, and report to NISA by May 2, 2011.

(April 30)

- NISA instructed TEPCO, pursuant to the provisions of Article 67, paragraph 1 of the Nuclear Regulation Act, to submit a report on the impact on stable cooling of the reactor and the following safety evaluation regarding the implementation of the measure to fill the PCV of Unit 1 of Fukushima Dai-ichi NPS with water up to the level above the reactor fuel.

- The impacts on structural strength and seismic adequacy of the reactor building (RB) and the PCV with the rise of the water level of the PCV.
- The impacts of rising pressure inside of the PCV due to the rise of the water level.
- The impacts caused by the increase of water leakage from the turbine building.
- Other required items in order to evaluate the safety involving the implementation of measures to fill the PCV with water to the level above the reactor fuel.

(May 2)

- NISA instructed TEPCO, pursuant to the provisions of Article 67, paragraph 1 of the Nuclear Regulation Act, to submit a report on the necessity for implementing measures to reduce the concentration of nuclear materials inside the reactor building of Unit 1, Fukushima Dai-ichi NPS (including future prospects for work inside the reactor building), as well as on each reduction measure (installation and use of the ambient air filtration system and opening of the double doors on the north side.) The report was received on May 3.

(May 5)

- With regard to the report received from TEPCO that the measure

to fill the PCV of Unit 1 of Fukushima Dai-ichi NPS with water up to the level above the reactor fuel was implemented, NISA conducted an evaluation and gave the following instruction.

- Sufficient monitoring of the water level inside the PCV and water leakage from the PCV shall be implemented. In addition, the measures that specify in advance the controls, etc., for the amount of injected water shall be adequately implemented.
- Seismic reinforcements to the supporting post of the Suppression Chamber, which has a small margin against the evaluation standard, shall be examined with improvements to the working environment, since the continued occurrence of aftershocks is to be expected.

(May 6)

- NISA requested Chubu Electric Power Co., Inc. to ensure that effective protective measures against tsunamis are put in place, to stock spare parts for seawater pumps, as well as to install air-cooled emergency power generators, etc. Until these measures are completed and are evaluated and confirmed by NISA, Chubu Electric was requested to shut down all Units in their NPS.

< Possibility of Radiation Exposure (As of 15:00 May 7) >

1. Exposure of Residents

- (1) Including about 60 evacuees from Futaba Public Welfare Hospital to Nihonmatsu City Fukushima Gender Equality Centre, as the result of measurement of 133 persons at the Centre, 23 persons counted more than 13,000cpm were decontaminated.
- (2) The 35 residents transferred from Futaba Public Welfare Hospital to Kawamata Town Saiseikai Kawamata Hospital by private bus arranged by Fukushima Prefecture were judged to be not contaminated by the Prefectural Response Centre.
- (3) As for the about 100 residents in Futaba Town evacuated by bus, the results of measurement for 9 of the 100 residents were as follows. The evacuees, moving outside the Prefecture (Miyagi Prefecture), were divided into two groups, which joined later to Nihonmatsu City



## Fukushima Gender Equality Centre.

No. of Counts	No. of Persons
18,000 cpm	1
30,000-36,000 cpm	1
40,000 cpm	1
little less than 40,000 cpm*	1
very small counts	5

\*(These results were measured without shoes, though the first measurement exceeded 100,000 cpm.)

- (4) The screening was started at the off-site Centre in Okuma Town from March 12 to 15. 162 people received examination until now. At the beginning, the reference value was set at 6,000cpm. 110 people were at the level below 6,000cpm and 41 people were at the level of 6,000cpm or more. When the reference value was increased to 13,000cpm afterward, 8 people were at the level below 13,000cpm and 3 people are at the level of 13,000cpm or more.

The 5 out of 162 people examined were transported to hospital after being decontaminated.

- (5) Fukushima Prefecture carried out the evacuation of patients and personnel of the hospitals located within 10km area. The screening of all the members showed that 3 persons have the high counting rate. These members were transported to the secondary medical institute of exposure. As a result of the screening on 60 fire fighting personnel involved in the transportation activities, the radioactivity higher than twice of the back ground was detected on 3 members. Therefore, all the 60 members were decontaminated.
- (6) Fukushima Prefecture has started the screening from March 13. It is carried out at the evacuation sites and the 10 places (set up permanently) such as health offices. Up until May 5, the screening was done to 182,239 people. Among them, 102 people were above the 100,000cpm, but when measured these people again without clothes, etc., the counts decreased to 100,000cpm and below, and there was no case

which affects health.

## 2. Exposure of Workers

With regard to the workers conducting operations in Fukushima Dai-ichi NPS, the total number of people who were at the exposure level above 100mSv reached 30.

For two out of the three workers who were confirmed to be at the level of exposure of more than 170mSv on March 24, the attachment of radioactive material on the skin of both legs was confirmed. As the two workers were judged to have a possibility of beta ray burn, they were transferred to the Fukushima Medical University Hospital, and after that, on March 25, all of the three workers arrived at the National Institute of Radiological Sciences in the Chiba Prefecture. As the result of examination, the level of exposure of their legs was estimated to be from 2 to 3Sv. The level of exposure of both legs and internal did not require medical treatment, but they decided to monitor the progress of all three workers in the hospital. All the three workers have been discharged from the hospital around the noon on 28 March. The three workers had the second medical examination at the National Institute of Radiological Sciences on 11 April, as a result, there was no problem regarding the condition of their health. The two workers who had been partially exposed to radiation on their skin of both legs were judged that any conditions of burn or red spots were not found on their skin.

At around 11:35 April 1, a worker fell into the sea when he went on board the USFJ barge in order to adjust the hose. He was rescued immediately by other workers around without any injury and external contamination. In order to make double sure, the measurement by a whole-body counter was implemented. As a result, it was evaluated that there was no internal radionuclide contaminant on April 12.

April 27 - The effective dose rate during a 3-month period starting from January 1 (4<sup>th</sup> Quarter of FY2010) of 1 (female) employee working after the occurrence of the Tohoku-District-off-the-Pacific-Ocean Earthquake was confirmed to be 17.55mSv, exceeding the statutory limit (5mSv/3 months). Following medical exams conducted by a doctor, it was confirmed that there was no impact on the health of this employee.

April 30 - TEPCO summarized the results of exposure dose measurement of workers engaged in emergency work and whose external exposure dose exceeded 100mSv at the end of March 2011. According to the summary, the results of exposure dose measurement (the total value of internal and external exposure and the number of personnel) were as follows: 2 persons with 200~250mSv, 8 persons with 150~200mSv, and 11 persons with 100~150mSv.

May 1 - A new case was confirmed regarding one female who was subjected to an exposure dose exceeding the statutory dose limit (5mSv/ 3 months). The woman received an exposure dose of 7.49mSv. As a result of a medical examination, it was confirmed that there was no health impact.

### 3. Others

- (1) 4 members of Self-Defence Force who worked in Fukushima Dai-ichi NPS were injured by explosion. One member was transferred to National Institute of Radiological Sciences. After the examination, judged that there were wounds but no risk for health from the exposure, the one was released from the hospital on March 17. No other exposure of the Self-Defence Force member was confirmed at the Ministry of Defence.
- (2) As for policeman, the decontaminations of two policemen were confirmed by the National Police Agency. Nothing unusual was reported.
- (3) On March 24, examinations of thyroid gland for 66 children aged from 1 to 15 years old were carried out at the Kawamata Town public health Center. The result was not at the level of having harmful influence.
- (4) From March 26 to 27, examinations of thyroid gland for 137 children aged from 0 to 15 years old were carried out at the Iwaki City Public Health Center. The result was not at the level of having harmful influence.
- (5) From March 28 to 30, examinations of thyroid gland for 946 children aged from 0 to 15 years old were carried out at the Kawamata Town Community Center and the Iitate Village Office. The result was not at the level of having harmful influence.

#### <Instruction of Screening Levels for Decontamination of Radioactivity>

- (1) On March 20, the Local Nuclear Emergency Response Headquarters issued the instruction to change the reference value for the screening

level for decontamination of radioactivity as the following to the Prefectural Governor, the Mayors of cities or towns and the Heads of villages (Tomioka Town, Futaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Katsurao Village, Hirono Town, Iwaki City and Iitate Village).

Old: 40Bq/cm<sup>2</sup> measured by a gamma-ray survey meter or 6,000cpm

New: 1  $\mu$  Sv/hour (dose rate at 10cm distance) or 100,000cpm equivalent

### <Instruction of Administrating Stable Iodine During Evacuation>

- (1) On March 16, the Local Nuclear Emergency Response Headquarters issued the “Instruction to Administer the Stable Iodine During Evacuation from the Evacuation Area (20km radius)” to the Prefectural Governor, the Mayors of cities or towns and the Heads of villages (Tomioka Town, Futaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Katsurao Village, Hirono Town, Iwaki City and Iitate Village).
- (2) On March 21, the Local Nuclear Emergency Response Headquarters issued the instruction titled as “Administration of the Stable Iodine” to the Prefectural Governor, the Mayors of cities or towns and the Heads of villages (Tomioka Town, Futaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Katsurao Village, Hirono Town, Iwaki City and Iitate Village), which instructs the above-mentioned governor, mayors and heads to administer stable Iodine under the instruction of the headquarters and in the presence of medical experts, and not to administer it on personal judgements.

### <Situation of Injuries, etc. (As of 15:00 May 7)>

1. Injury in Unit 1 of Fukushima Dai-ichi NPS due to earthquake on 11 March
  - Two employees (slightly, have already returned to work)
  - Two employees (a cut by a broken glass by earthquake and tsunami, have already returned to work)
  - One employee (a scratch when evacuating, has already returned to work)
  - One subcontract employee (fracture in both legs, be in hospital)

- Two died (After the earthquake, two TEPCO's employees missed and had been searched continuously. In the afternoon of March 30, the two employees were found on the basement floor of the turbine building of Unit 4 and were confirmed dead by April 2.)
2. Injury Due to the Explosion of Unit 1 of Fukushima Dai-ichi NPS on 12 March
    - Four employees (two TEPCO's employees and two subcontractor's employees) were injured at the explosion and smoke of Unit 1 around the turbine building (non-controlled area of radiation) and were examined by Kawauchi Clinic. Two TEPCO's employees return to work again and two subcontractors' employees are under home treatment.
  3. Injury Due to the Explosion of Unit 3 of Fukushima Dai-ichi NPS on 14 March.
    - Four TEPCO's employees (They have already returned to work.)
    - Three subcontractor's employees (They have already returned to work.)
    - Four members of Self-Defence Force (one of them was transported to National Institute of Radiological Sciences considering internal possible exposure. The examination resulted in no internal exposure. The member was discharged from the institute on March 17.)
  4. Other Injuries
    - During the earthquake on March 11, one subcontractor's employees (a crane operator) died in Fukushima Dai-ni NPS. (It seems that the tower crane broke and the operator room was crushed and the person was hit on the head.)
    - One subcontractor's employee was transported to the hospital on March 11. (Later, turned out a cerebral infarction)
    - One emergency patient on March 12. (A cerebral stroke, transported by the ambulance, be in hospital)
    - Ambulance was requested for one employee complaining the pain at left chest outside of control area on March 12. (Conscious, under home treatment)

- One employee suffered lacerations on his left arm and was transported to the hospital for treatment on March 12. (Has already returned to work)
- Two employees complaining discomfort wearing full-face mask in the Main Control Room were transported to Fukushima Dai-ni NPS for a consultation with an industrial doctor on March 13. (One employee has already returned to work and the other is under home treatment.)
- Two subcontractor's employees were injured during working at temporary control panel of power source in the Common Spent Fuel Pool, transported to where were industrial medical doctors the Fukushima Dai-ni NPS on March 22 and 23. (One employee has already returned to work and the other is under home treatment.)
- On the afternoon of April 7, a worker who was making sandbags at the soil disposal yard (spoil bank) on the north side of Fukushima Dai-ichi NPS got sick and was transported to J-Village for the body survey of contamination of radioactive materials. Being confirmed to be free from contamination, the worker was taken to the Iwaki City Kyouritsu Hospital by ambulance. On April 8, the worker was diagnosed as dehydration and transient unconsciousness.
- At 09:19 April 9, one subcontractor's employee was transported to a hospital as the worker wearing full-face mask felt discomfort during the work for cable processing in the Building of Water Processing, stepped on the manhole outside the building, which lid was shifted, and injured. As a result of medical examination, the worker was diagnosed as a right knee contusion and suspect of right knee medial collateral ligament injury. Furthermore, as a result of the body survey, it was confirmed that the worker was free from contamination of radioactive materials.
- Around 11:10 April 10, a subcontractor's employee who was conducting the operations of laying drain hoses in the yard of Unit 2 got sick and was transported to J-Village. Thereafter the employee was taken to the Iwaki City Kyouritsu Hospital by ambulance at 14:27 on the same day. It was confirmed that the employee was free from adhesion of radioactive materials to his body
- Around 16:30 April 23, outside the NPS site (in a ready-mixed concrete plant in Naraha Town), a worker was carrying out maintenance work on the connection part of a hose used by a concrete mixer, when liquid

splashed into his eyes. Because he felt pain, he was transported to J-Village where he was examined by an industrial doctor and taken to Iwaki City Municipal Kyoritsu Hospital by ambulance as a precautionary measure since no ophthalmologist was available nearby. The worker was treated with ointment, etc. in the left eye and went home with an eye bandage. Since no specialist was available, the worker revisited the hospital on April 24, and was diagnosed with moderate conjunctivitis requiring treatment at the hospital for about a week. Since he was allowed to engage in regular work, he returned to normal work (indoors) from April 24.

- At around 11:00 am May 5, one worker of a subcontractor fell from a stepladder and got injured when assembling a temporary rest station at the parking area outside the west gate of Fukushima Daiichi NPS. The worker was taken to the Fukushima Rosai Hospital by ambulance. There was no contamination to the body of this worker.

<Situation of Resident Evacuation (As of 15:00 May 7)>

At 11:00 March 15, the Prime Minister instructed in-house stay to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS. The instruction was conveyed to Fukushima Prefecture and related municipalities.

Regarding the evacuation as far as 20km from Fukushima Dai-ichi NPS and 10km from Fukushima Dai-ni NPS, necessary measures have already been taken.

- The in-house stay in the area from 20km to 30km from Fukushima Dai-ichi NPS is made fully known to the residents concerned.
- Cooperating with Fukushima Prefecture, livelihood support to the residents in the in-house stay area is implemented.
- On March 28, Chief Cabinet Secretary mentioned the continuation of the limited-access within the area of 20km from Fukushima Dai-ichi NPS. On the same day, the Local Nuclear Emergency Response Headquarters notified the related municipalities of forbidding entry to the evacuation area within the 20km zone.

At 11:00 April 21, the Prime Minister issued the instruction in relation to the accident at Fukushima Dai-ni NPS to change the evacuation area from within 10km radius to within 8km radius from Fukushima Dai-ni NPS.

At 11:00 April 21, the Prime Minister issued the instruction to establish a restricted area as the area within 20km from Fukushima Dai-ichi NPS, and to prohibit the access to the area or to order to leave the area to any persons other than those engaged in emergency response measures, excluding the case that the mayor of the city or town or the head of the village permits the temporary access. (Date of establishment of the restricted area: 0:00 April 22)

At 9:44 April 22, the Prime Minister issued the instruction to lift the area of in-house stay which had been established for the sphere within 20km to 30km radius from Fukushima Dai-ichi NPS, and to establish Deliberate Evacuation as well as Evacuation-Prepared Areas in Case of Emergency, for the residents and others to make preparations for deliberate leaving, or for evacuation or in-house stay at any time during an emergency, in the subject area.

#### <Instructions Regarding Foods and Drinks>

An instruction from the Director-General of the Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi and Chiba was issued, which instructed above-mentioned governors to suspend shipment and so on of the following products for the time being.

The Government Nuclear Emergency Response Headquarters organized the thoughts of imposing and lifting restrictions on shipment as follows, considering the NSC's advice.

- The area where restrictions on shipment to be imposed or lifted could be decided in units of the area where a prefecture is divided into, such as cities, towns, villages and so on, considering the spread of the contamination affected area and the actual situation of produce collection, etc.
- The restriction on shipment of the item, of which the result of the sample test exceeded the provisional regulation limits, shall be decided by judging in a comprehensive manner considering the regional spread of the contamination impact.



- Lifting the restrictions on shipment shall be implemented when a series of three results of nearly weekly tests for the item or the area falls below the provisional regulation limits, considering the situation of the Fukushima Dai-ichi NPS.
- However, the tests shall be carried out nearly weekly after the lifting, while the release of the radioactive materials from the NPS continues.

(1) Items Under the Suspension of Shipment and Restriction of Intake (As of 15:00 May 7)

Prefectures	Suspension of Shipment	Restriction of Intake
Fukushima Prefecture	Non-head type leafy vegetables (excluding some areas* <sup>1</sup> ) head type leafy vegetables (excluding some areas* <sup>2</sup> ), flowerhead brassicas (Spinach, Cabbage, Broccoli, Cauliflower, <i>Komatsuna</i> *, <i>Kukitachina</i> *, <i>Shinobufuyuna</i> *, Rape, <i>Chijirena</i> , <i>Santouna</i> *, <i>Kousaitai</i> *, <i>Kakina</i> *, etc.), (excluding some areas* <sup>3</sup> ) Turnip (excluding some areas* <sup>4</sup> ), Raw milk (limited to Minamisoma-City (limited to Haramachi-ku, Odaka-ku, and the areas of Karasuzaki, Ouchi, Kawago and Shiozaki within Kashima-ku), Tamura-City (limited to former Miyakoji-Village area), Kawamata Town Yamakiya area, Namie Town, Futaba Town, Okuma Town, Tomioka Town, Naraha Town,	Non-head type leafy vegetables (excluding some areas * <sup>1</sup> ), head type leafy vegetables (excluding some areas* <sup>2</sup> ), and flowerhead brassicas (Spinach, Cabbage, Broccoli, Cauliflower, <i>Komatsuna</i> *, <i>Kukitachina</i> *, <i>Shinobufuyuna</i> , Rape, <i>Chijirena</i> , <i>Santouna</i> *, <i>Kousaitai</i> *, <i>Kakina</i> *, etc.), (excluding some areas* <sup>3</sup> ) Shiitake (only ones grown on raw lumber in open fields of Iitate Village), Juvenile sand lance (Kounago)

	<p>Hirono Town, Iitate Village, Katsurao Village, Kawauchi Village, Kitashiobara Village, Nishiaizu Town, Aizubange Town, Yukawa Village, Aizuwakamatsu City, Tenei Village, Yaizu Town, Showa Village, Kaneyama Town, Tadami Town, Showa Village, Hinoemata Village and Tamagawa Village. )</p> <p>Shiitake (only ones grown on raw lumber in open fields of Date City, Soma City, Minamisouma City, Tamura City, Iwaki City, Motomiya City, Shinchi Town, Kawamata Town, Namie Town, Futaba Town, Okuma Town, Tomioka Town, Naraha Town, Hirono Town, Iitate Village, Katsurao Village, Kawauchi Village and Fukushima City), Juvenile sand lance (Kounago)</p>	
Ibaraki Pref.	Spinach (only ones produced in Kitaibaraki City and Takahagi City)	

\*a green vegetable

\*1 The Kennan Area of Fukushima Prefecture (Shirakawa-City, Yabuki-Town, Tanagura-Town, Yamatsuri-Town, Hanawa-Town, Nishigo-Village, Izumizaki-Village, Nakajima-Village and Samegawa-Village) and Iwaki City.

\*2 Aizuwakamatsu-City, Kitakata-City, Nishiaizu-Town, Bandai-Town, Inawashiro-Town, Aizubange-Town, Yanaizu-Town, Mishima-Town, Kaneyama-Town, Aizumisato-Town, Shimogo-Town, Tadami-Town, Minamiaizu-Town, Kitashiobara-Village, Yukawa-Village, Showa-Village, Hinoemata-Village, the Kenchu Area of Fukushima Prefecture (Koriyama-City, Sukagawa-City, Tamura-City (excluding the area within 20 km radius from the Fukushima Dai-ichi NPS), Kagami-ishi-Town, Ishikawa-Town, Asakawa-Town, Furudono-Town, Miharu-Town, Ono-Town, Tenei-Village, Tamakawa-Village, Hirata-Village) and Iwaki-City

\*3 Shirakawa-City, Yabuki-Town, Tanagura-Town, Yamatsuri-Town, Hanawa-Town, Nishigo-Village, Izumizaki-Village, Nakajima-Village, Samegawa-Village and Iwaki-City.

\*4 The Kenhoku Area of Fukushima Prefecture (Fukushima-City, Nihonmatsu-City, Date-City, Motomiya-City, Koori-Town, Kunimi-Town, Kawamata Town (excluding Yamakiya area), Otama-Village), the Kenchu Area of Fukushima Prefecture (Koriyama-City, Sukagawa-City, Tamura-City (excluding the area within 20 km radius from the Fukushima Dai-ichi NPS), Kagami-ishi-Town, Ishikawa-Town, Asakawa-Town, Furudono-Town, Miharu-Town, Ono-Town, Tenei-Village, Tamakawa-Village, Hirata-Village) and Iwaki-City

(2) Request for Restriction of Drinking Tap-Water (As of 15:00 May 7)

Scope under restriction	Water service (Local governments requested for restriction)
All residents	None
Babies ・ Water services that continue to respond to the instruction  ・ Tap-water supply service that continues to respond to the instruction	<Fukushima Prefecture> Iitate small water service (Iitate Village, Fukushima Prefecture)  None

## <Instruction Regarding the Ventilation when Using Heating Equipments in the Area of Indoor Evacuation >

On March 21, an instruction titled “Ventilation for Using Heating Equipments within the In-house Evacuation Zone” was issued from the Director-General of Local Nuclear Emergency Response Headquarters to the Prefectural Governor, the Mayors of cities and towns and the Heads of villages (Iwaki City, Tamura City, Minamisouma City, Hirono Town, Kawauchi Village, Namie Town, Katsurao Village, and Iitate Village), which instructs the above Governors, Mayors and Heads to publicly announce the guidance to the residents within the in-house evacuation zone, concerning the indoor use of heating equipments that require ventilation, in order to avoid poisoning from carbon monoxide and to reduce exposure.

## < Fire Bureaus’ Activities>

- From 11:00 till around 14:00 on March 22, Niigata-City Fire Bureau and Hamamatsu City Fire Bureau gave guidance to TEPCO as to the set up of large decontamination system.
- From 8:30 till 9:30, from 13:30 till 14:30 on March 23, Niigata City Fire Bureau and Hamamatsu City Fire Bureau gave guidance to TEPCO as to the operation of large decontamination system.

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