Current Conditions: Fresh water is being injected to the Spent Fuel Pool and the Reactor Core.

April 27 10:02  Started the operation of gradually changing the amount of water for injection to the Reactor Pressure Vessel, (RPV) from about 6 m³/h to the maximum of about 14 m³/h. After carrying out the injection at 10 m³/h, the injection rate was changed back to 6 m³/h. (April 29 10:14)

April 29 11:36~14:05 Confirmed the situation in the reactor building using an unmanned robot.

May 2 12:58 ~ 15:03 The pump for the injection of water into the Reactor Core was temporarily replaced with the Fire Extinguishing Pump in order to install an alarm device in the pump.

May 5 16:36 ~ May 8 20:02 Operated all ambient filtration systems (a total of 6 units) in order to improve the working environment in the reactor building.

May 6 10:01 Changed the rate of water injection into the Reactor Core from 6 m³/h to 8 m³/h.

May 8 20:08 Ventilation by cutting of the exhaust air duct

May 9 04:17 Opening the double-entry doors of the Reactor Building

May 9 05:10 Disassembly of positive pressure house

May 10 10:55 (approx.) Calibrated the reactor water level gauge

May 11 08:47 ~ 15:55 Due to the restoration of the Okuma No.2 transmission line, the power supply for the water injection pump into the reactor was temporarily switched to the temporary diesel generator.

May 11 08:50 ~ 15:58 Due to the restoration of the Okuma No.2 transmission line, the nitrogen injection was temporarily suspended.

May 11 16:01 ~ 17:39 Confirmed the reactor water level of RPV, calibrated reactor pressure gauge of primary containment vessel.

May 13 16:01 ~ 17:39 Observed the situation in the Reactor Building using a remote-control robot

May 14 13:28 Changed the rate of water injection into the Reactor Core from 8 m³/h to 10 m³/h.

May 16 11:50 Changed the rate of water injection into the Reactor Core from 10 m³/h to 6 m³/h.

May 20 09:30 ~ 12:15 Confirmed reactor water level, stopped nitrogen injection to PCV were suspended for changing power supply.

May 20 15:07 ~ 15:18 Water spray over the Spent Fuel Pool by Concrete Pump Truck (stopped due to strong winds)

May 25 08:50 ~ 11:14 Confirmed the reactor water level of RPV, calibrated reactor pressure gauge of primary containment vessel.

May 25 16:01 ~ 17:39 Observed the situation in the Reactor Building using a remote-control robot

May 25 15:45 Confirmed that the compressor for nitrogen supplying was stopped. 19:44 Restart the nitrogen injection after changing to the reserve compressor.

May 26 10:30 ~ 12:00 and around 15:00 Entered in the reactor building, Installed the level gauge of reactor building accumulated water, Sampled basement accumulated water, and Installed hoses for SFP.

May 28 16:47 ~ 17:00 Leak test in order to inject fresh water to SFP via FPC

May 28 20:30 Changed the rate of water injection into the Reactor Core from 6 m³/h to 5 m³/h.

June 3 10:38 ~ 12:21 Installed temporary pressure gauges for the reactor.

June 3 around 15:00 ~ 17:00 Confirmed the situation in the reactor building using an unmanned robot.

June 4 09:57 ~ 13:56 Suspended the injection of coolant water due to the work for changing the route of water supply line to the Reactor Core. (10:02 ~ 13:43 Injected water into the Reactor Core by the fire engine pump.)

June 8 14:57 ~ 17:54 Suspended the nitrogen injection due to the stop of the power center 2C.

June 13 14:58 ~ 17:43 Transfer the accumulated water from the Condenser to the basement of turbine building.

June 14 14:09 Replaced the pump for the injection of water into the Reactor Core with the Fire Extinguishing Pump.

June 14 15:35 ~ 15:50 Suspended water injection to replace the hose of water injection into the reactor.

June 15 10:06 The water injection rate into the reactor was changed from about 5 m³/h to about 4.5 m³/h.

June 15 10:33 ~ June 16 09:52 Transferred the accumulated water from the Condenser to the CST.
June 19 10:35 ~ 15:47 Due to preparation for the suspension works of the Okuma No.2 transmission line, the power supply for the water injection pump into the Reactor Core was temporarily switched to the diesel generator.
June 19 11:48 ~ 16:05 Due to preparation for the suspension works of the Okuma No.2 transmission line, the nitrogen injection was temporarily suspended.
June 21 10:02 The water injection rate into the reactor was changed from about 4.5 m³/h to about 4.0 m³/h.
June 21 11:55 ~ 18:03 The nitrogen injection was temporarily suspended due to the installation work of a temporary transformer.
June 22 10:02 The water injection rate into the reactor was changed from about 4.0 m³/h to about 3.5 m³/h.
June 23 18:27 Water injection into the Reactor Core of Units 1 and 2 was begun, using the water injection pump into the Reactor Core for Unit 1.
June 27 08:08 ~ 14:38 The nitrogen injection was temporarily suspended due to preparation for the restoration works of the Okuma No.2 transmission line to the diesel generator.
June 27 08:51 ~ 15:07 Due to preparation for the restoration works of the Okuma No.2 transmission line, the nitrogen injection was temporarily suspended.
June 27 16:20 Started use of water treated in the water treatment facilities for injection into the reactor, in addition to water injection from the filtered water tank. Suspended supply of treated water because of a leakage from the pipe (17:55). Started the treated water transfer pump (June 28 14:36). Resumed supply of treated water (June 28 15:55).
June 29 10:59 ~ 13:33 Regarding the Circulating Injection Cooling of the Reactor Cores, supply of treated water was temporarily suspended due to leakage from a pipe for injection cooling.
July 1 07:27 ~ July 2 14:22 Temporarily suspended supply of treated water into the reactor due to works to install and connect a buffer tank. (July 2 14:22 ~ 18:00 Trial injected into the Reactor Core from a Buffer Tank due to leakage check. 18:00 ~ Full-fledged operated)
July 4 08:50 The water injection rate into the reactor was adjusted to 3.8 m³/h, due to decrease to 3.0 m³/h.
July 14 05:30 The water injection rate into the reactor was adjusted to 3.5 m³/h, due to decrease to 3.2 m³/h.
July 15 08:55 The water injection rate into the reactor was adjusted to 3.8 m³/h, due to decrease to 3.2 m³/h.
July 17 10:06 The water injection rate into the reactor was adjusted to 3.8 m³/h, due to decrease to 3.0 m³/h.
July 17 14:25 The water injection rate into the reactor was adjusted to 4.0 m³/h, after switching from the number 1 pump for injecting water into the reactor to the number 2 pump.
July 19 10:10 The water injection rate into the reactor was adjusted to 3.8 m³/h.
July 24 11:10 The water injection rate into the reactor was adjusted to 3.8 m³/h, due to decrease to 3.3 m³/h.

<Water spray over the Spent Fuel Pool by Concrete Pump Truck (Fresh water)>
March 31 13:03 ~ 16:04, May 20 15:06 ~ 16:15, May 22 15:33 ~ 17:09

<Fresh water injection to SFP via FPC (using the temporary motor-driven pump)>
May 29 11:10 ~ 15:35, June 5 10:16 ~ 10:48, July 5 15:10 ~ 17:30
Current Conditions: Fresh water is being injected to the Spent Fuel Pool and the Reactor Core.
Major Events after the Earthquake 2/3

April 25 10:57～18:25 For reinforcement work of the power supply, the power supply to the pump injecting water into the Reactor Core was temporarily switched from the external power supply to the temporary diesel generator.

April 25 14:44～17:38 Implemented reinforcement work of the power supply (connection of the power supplies between Units 1-2 and Units 5-6).

April 29 09:16 Suspended the transfer of accumulated water from the turbine building Trench of Unit 2 (accumulated water with high-level radioactivity) to the Radioactive Waste Treatment Facilities in order to carry out inspections, etc. of the transfer facilities. The transfer was resumed. (From 14:05 April 30th)

May 1 13:35～ Started blocking the vertical shafts of Trench pit.

May 2 12:58～14:53 The pump for the injection of water into the Reactor Core was temporarily replaced with the Fire Extinguishing Pump in order to install an alarm device in the pump.

May 7 09:22 Suspended the transfer of accumulated water from the turbine building Trench of Unit 2 (accumulated water with high-level radioactivity) to the Radioactive Waste Treatment Facilities in order to carry out piping work of Reactor Feedwater System for Unit3. The transfer was resumed. (From 16:02 May 7th)

May 10 09:01～May 12 15:20 Suspended the transfer of accumulated water from the turbine building Trench of Unit 2 (accumulated water with high-level radioactivity) to the Radioactive Waste Treatment Facilities in order to lay the water transfer pipes from the turbine building of Unit 3 to the Radioactive Waste Treatment Facilities.

May 11 08:47～15:55 Due to the restoration of the Okuma No.2 transmission line, the power supply for the water injection pump into the reactor was temporarily switched to the temporary diesel generator. (After the restoration, the power supply is partially received from this line.)

May 18 09:24～09:38 Conducted preliminary survey in the Reactor Building.

May 25 09:05～15:30 Suspended the transfer of accumulated water from the turbine building Trench to the Radioactive Waste Treatment Facilities in order to change power supply.

May 26 14:45～May 27 14:30 Transferred the water from the Condenser to the basement of the turbine building in order to carry out piping work of Reactor Feedwater System.


May 26 16:01 Suspended the transfer of accumulated water from the turbine building Trench to the Radioactive Waste Treatment Facilities. (Because the water level of the concerned Facilities was close to the first basement level.)

May 29 11:33 Started to inject water to the Reactor Core via Feedwater line in addition to Fire Extinguish line

May 30 11:15 Conducted a leakage test on the secondary system of the alternative cooling system for the Spent Fuel Pool. A trial run of the secondary system was started at 15:02.

May 30 18:05 Stopped injecting water to the Reactor Core via Fire Extinguish line.

May 31 11:40 Conducted a leakage test on the primary system of the alternative cooling system for the Spent Fuel Pool.

May 31 17:21 Started full-fledged operation of the alternative cooling system for the Spent Fuel Pool.

June 3 13:49～14:09 Suspended the injection of coolant water due to the work for changing the route of water supply line to the Reactor Core.

June 3 18:39～June 4 12:28 Transferred the accumulated water from the trench of the turbine building to the condenser.

June 4 18:39～June 16 18:40 Transferred the accumulated water from the turbine building trench to the Radioactive Waste Treatment Facilities.

June 8 15:40～18:03 Suspended the transfer of accumulated water from the turbine building trench to the Radioactive Waste Treatment Facilities due to the stop of the power center 2C.

June 11 11:45～12:19 Conducted a test run of the ambient air filtration system of the reactor building.

June 12 11:42～12:19 Started full-scale operation of the ambient air filtration system of the reactor building.

June 12 14:09～12:37 Suspended water injection to replace the hose of water injection into the reactor.

June 17 14:20～14:59 Transferred accumulated water from the turbine building trench to the condenser of Unit 1 (suspended due to a malfunction of the pump).

June 19 10:49～15:35 Due to preparation for the suspension works of the Okuma No.2 transmission line, the power supply for the water injection pump into the Reactor Core was temporarily switched to the diesel generator.

June 19 11:03～16:00 Due to preparation for the suspension works of the Okuma No.2 transmission line, the alternative cooling system for the Spent Fuel Pool was temporarily suspended.

June 19 12:12～16:02 Due to preparation for the suspension works of the Okuma No.2 transmission line, the local exhauster was temporarily suspended.

June 19 20:51～The double door of the reactor building was slightly opened. June 20th The double door was fully opened from 05:00.

June 20 13:37～Started to transfer accumulated water from the turbine building trench to the condenser of Unit 1.
Major Events after the Earthquake 3/3

June 21 10:04  The water injection rate into the reactor was changed from about 5.0m³/h to about 4.5m³/h.
June 21 13:15～13:25  Preliminary survey was conducted inside of the reactor building.
June 22 09:56  Started to transfer accumulated water from the turbine building trench to the Radioactive Waste Treatment Facilities.
June 22 10:04  The water injection rate into the reactor was changed from about 4.5m³/h to about 4.0m³/h.
June 23 10:36～12:36  Installation works of temporary pressure gauges for the reactor was conducted.
June 23 18:27  Water injection into the Reactor Core of Units 1 and 2 was begun, using the water injection pump into the Reactor Core for Unit 1.
June 24 around 6:58  An unmanned helicopter that was collecting dust coming out of the opening of the reactor building made an emergency landing on the rooftop of the building.
June 27 08:08～14:38  Due to preparation for the restoration works of the Okuma No.2 transmission line, the power supply for the water injection pump into the Reactor Core was temporarily switched to the diesel generator.
June 27 08:23～16:53  Due to preparation for the restoration works of the Okuma No.2 transmission line, the alternative cooling system for the Spent Fuel Pool was temporarily suspended.
June 27 09:02～17:07  Due to preparation for the restoration works of the Okuma No.2 transmission line, transfer of accumulated water in the turbine building trench to the Radioactive Waste Treatment Facilities was temporarily suspended.
June 27 16:20  Started use of water treated in the water treatment facilities for injection into the reactor, in addition to water injection from the filtered water tank. Suspended supply of treated water because of a leakage from the pipe (17:55). Started the treated water transfer pump (June 28 14:36). Resumed supply of treated water (June 28 15:55).
June 28 20:08  Started nitrogen Injection into the PCV.
June 29 10:59～13:33  Regarding the Circulating Injection Cooling of the Reactor Cores, supply of treated water was temporarily suspended due to leakage from a pipe for injection cooling.
July 1 07:27～July 2 14:22  Temporarily suspended supply of treated water into the reactor due to works to install and connect a buffer tank. (July 2 14:22 ～ 18:00 Trial injected into the Reactor Core from a Buffer Tank due to leakage check. 18:00 ～ Full-fledged operated)
July 8 10:34～13:49  Sampling of airborne radioactive materials was conducted by a robot on the second and the third floors of the reactor building.
July 8 10:44 ～ 12:30  Flashing was carried out for the transfer line from the trench of the turbine building to the Radioactive Waste Treatment Facilities.
July 13 10:09  Restarted to transfer accumulated water from the turbine building trench to the Radioactive Waste Treatment Facilities.
July 15 08:22 ～ 11:47  Suspended the cooling tower of alternative cooling system for spent fuel pool.
July 16 10:56 ～  Transferred accumulated water from the turbine building trench to the Radioactive Waste Treatment Facilities.
July 17 14:25  The water injection rate into the reactor was adjusted to 4.0 m³/h, after switching from the number 1 pump for injecting water into the reactor to the number 2 pump.
July 19 10:10  The water injection rate into the reactor was adjusted to 3.8 m³/h.
July 22 08:43  The water injection rate into the reactor was adjusted to 3.8m³/h due to the decrease to 3.4m³/h.
July 22 16:56 ～  Transferred accumulated water from the turbine building trench to the Radioactive Waste Treatment Facilities.
July 23 09:35  The water injection rate into the reactor was adjusted to 3.8m³/h due to the decrease to 3.2m³/h.

<Sea water injection to SFP via FPC (using the fire engine pump)>
March 20 15:05～17:20, March 22nd 16:07～17:01, March 25 10:30～12:19

<Fresh water injection to SFP via FPC (using the temporary motor-driven pump)>
March 29 16:30～18:25, March 30 09:25～23:50  *Including interruption by pump malfunction and damage to the hose, April 1 14:56～17:05, April 4 11:05～13:37, April 7 13:29 ～ 14:34, April 0 10:37～12:38, April 13 13:15～14:55, April 16 10:13～11:54, April 19 16:08～17:28, April 22 15:55～17:40, April 25 10:12～11:18, April 28 10:15～11:28, May 2 10:05～11:40, May 6 09:36～11:16, May 10 13:09～14:45(13:19 ～ 14:35 Hydrazine was also injected), May 14 13:00～14:37(13:08 ～ 14:02 Hydrazine was also injected), May 18 13:10～14:40(13:15 ～ 14:30 Hydrazine was also injected), May 22 13:02～14:40(13:04 ～ 14:03 Hydrazine was also injected), May 26 10:06～11:36(10:10～11:10 Hydrazine was also injected), May 30 12:06～13:52
### Conditions of Fukushima Dai-ichi Nuclear Power Station  
**Unit 3**  
(As of 12:00 July 24, 2011)

#### Current Conditions: Fresh water is being injected to the Spent Fuel Pool and the Reactor Core

**Spent Fuel Pool Water Temperature:** 30.4 °C  
**Reactor Pressure A:** -0.065MPa* (under monitoring of the change of the situation)  
**Reactor Pressure C:** -0.003MPa* (under monitoring of the change of the situation)  
**Reactor Water Level A:** -1.900mm (under monitoring of the change of the situation)  
**Reactor Water Level B:** -2.300mm (under monitoring of the change of the situation)  
**Reactor Pressure Vessel (RPV):** 108.3°C (under monitoring of the change of the situation)  
**Temperature at the bottom head of RPV:** 108.3°C  
**Feedwater Nozzle Temperature:** 126.5°C (under monitoring of the change of the situation)  
**PCV**³ Pressure 0.1016MPa* (changed the monitor from 05:00 July 16)  

#### Spent Fuel Pool Cooling System

- **Spraying freshwater by temporary motor driven pump through existing cooling system**

#### External Power

- **EDG**²
  - Power supply vehicle, Temporary DGs
- **RHRS**¹
  - Injecting freshwater by temporary motor-driven pump

#### RHRS

- **S/P**³
  - Water Temperature A: 49.9°C  
  - Water Temperature B: 46.0°C  
  - Condition: Almost no change  
  - Pressure 0.1841MPa  
  - Condition: Almost no change

#### Major Events after the Earthquake 1/3

<table>
<thead>
<tr>
<th>Event</th>
<th>Date/Time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 11</td>
<td>14:46</td>
<td>Under operation, Automatic shutdown by the earthquake</td>
</tr>
<tr>
<td>March 11</td>
<td>15:42</td>
<td>Report based on the Article 10 (Total loss of A/C power)</td>
</tr>
<tr>
<td>March 13</td>
<td>05:10</td>
<td>Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)</td>
</tr>
<tr>
<td>March 13</td>
<td>08:41</td>
<td>Started to vent.</td>
</tr>
<tr>
<td>March 13</td>
<td>around 09:10</td>
<td>Unusual rise of the pressure in PCV</td>
</tr>
<tr>
<td>March 13</td>
<td>13:12</td>
<td>Started to inject seawater and borated water to the Reactor Core.</td>
</tr>
<tr>
<td>March 14</td>
<td>05:20</td>
<td>Started to vent.</td>
</tr>
<tr>
<td>March 14</td>
<td>11:01</td>
<td>Sound of explosion</td>
</tr>
<tr>
<td>March 16</td>
<td>around 08:30</td>
<td>White smoke generated.</td>
</tr>
<tr>
<td>March 17</td>
<td>09:48</td>
<td>Water discharge by the helicopters of Self-Defense Force</td>
</tr>
<tr>
<td>March 17</td>
<td>around 19:05</td>
<td>Water spray from the ground by High pressure water-cannon trucks of Police</td>
</tr>
<tr>
<td>March 17</td>
<td>19:35</td>
<td>Water spray from the ground by fire engines of Self-Defense Force</td>
</tr>
<tr>
<td>March 18</td>
<td>around 14:00</td>
<td>Water spray from the ground by 6 fire engines of Self-Defense Force</td>
</tr>
<tr>
<td>March 18</td>
<td>14:42</td>
<td>Water spray from the ground by a fire engine of the US Military</td>
</tr>
<tr>
<td>March 19</td>
<td>00:30</td>
<td>Water spray by Hyper Rescue Unit of Tokyo Fire Department</td>
</tr>
<tr>
<td>March 19</td>
<td>14:10</td>
<td>Water spray by Hyper Rescue Unit of Tokyo Fire Department</td>
</tr>
<tr>
<td>March 20</td>
<td>11:00</td>
<td>Pressure of PCV rose(320Pa). Afterward fell.</td>
</tr>
<tr>
<td>March 20</td>
<td>21:36</td>
<td>Water spray by Hyper Rescue Unit of Tokyo Fire Department</td>
</tr>
<tr>
<td>March 21</td>
<td>around 15:55</td>
<td>Grayish smoke generated and was confirmed to die down at 17:55.</td>
</tr>
<tr>
<td>March 22</td>
<td>15:10</td>
<td>Water spray by Hyper Rescue Unit of Tokyo Fire Department and Osaka City Fire Bureau.</td>
</tr>
<tr>
<td>March 22</td>
<td>22:46</td>
<td>Lighting in the Central Control Room was recovered.</td>
</tr>
<tr>
<td>March 23</td>
<td>11:03</td>
<td>Injection of about 35 ton of sea water to the Spent Fuel Pool (SFP) via the Fuel Pool Cooling Line (FPC)</td>
</tr>
<tr>
<td>March 23</td>
<td>16:20</td>
<td>Black smoke generated and was confirmed to die down at around 23:30 and 04:50.</td>
</tr>
<tr>
<td>March 24</td>
<td>05:35</td>
<td>Injection of around 120 ton of sea water to the Spent Fuel Pool (SFP) via FPC</td>
</tr>
<tr>
<td>March 25</td>
<td>13:28</td>
<td>Water spray by Kawasaki City Fire Bureau supported by Tokyo Fire Department</td>
</tr>
<tr>
<td>March 25</td>
<td>18:02</td>
<td>Started fresh water injection to the core.</td>
</tr>
<tr>
<td>March 27</td>
<td>12:34</td>
<td>Water spray by Concrete Pump Truck</td>
</tr>
<tr>
<td>March 28</td>
<td>17:40</td>
<td>Transferring the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)</td>
</tr>
<tr>
<td>March 28</td>
<td>20:30</td>
<td>Water injection to the core using a temporary motor-driven pump.</td>
</tr>
<tr>
<td>April 1</td>
<td>11:50</td>
<td>The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.</td>
</tr>
<tr>
<td>April 11</td>
<td>around 17:16</td>
<td>Loss of external power supply of Unit 1 and 2 due to an earthquake occurred (at Hamadori in Fukushima Prefecture) and water injection to the Reactor Core was suspended.</td>
</tr>
<tr>
<td>April 11</td>
<td>18:04</td>
<td>External power supply of Units 1 and 2 recovered (April 11th 17:56). Resumed injecting water to the Reactor Core.</td>
</tr>
<tr>
<td>April 17</td>
<td>11:30</td>
<td>Confirmed the situation in the reactor building using unmanned robot.</td>
</tr>
<tr>
<td>April 18</td>
<td>13:55</td>
<td>Stopped the water injection to the Reactor Core to replace the current hose with a new one</td>
</tr>
<tr>
<td>April 19</td>
<td>10:23</td>
<td>Completed the work of strengthening connection of the power supplies between Units 1-2 and Units 3-4.</td>
</tr>
<tr>
<td>April 22</td>
<td>13:40</td>
<td>Tentatively Injected freshwater to SFP via the Fuel Pool Cooling Line.</td>
</tr>
<tr>
<td>April 25</td>
<td>10:57</td>
<td>For reinforcement work of the power supply, the power supply to the pump injecting water into the Reactor Core was temporarily switched from the external power supply to the temporary diesel generator.</td>
</tr>
<tr>
<td>April 30</td>
<td>11:34</td>
<td>Completed reinforcement work of the power supply both Units 3, 4. (Increasing the voltage from 6.6kv to 66kv)</td>
</tr>
</tbody>
</table>

*1 Residual Heat Removal System  
*2 Emergency Diesel Generator  
*3 Primary Containment Vessel  
*4 Suppression Pool  
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)
May 2 12:58 ~ 14:53 The pump for the injection of water into the Reactor Core was temporarily replaced with the Fire Extinguishing Pump in order to install an alarm device in the pump.

May 8 16:18 ~ May 10 5:41 Transferred the water in the Condenser to the underground of the turbine building in order to carry out piping work of Reactor Feedwater System.

May 11 08:47 ~ 15:55 Due to the restoration of the Okuma No.2 transmission line, the power supply for the water injection pump into the reactor was temporarily switched to the temporary diesel generator.

May 11 around 12:30 Confirmed the water flow into the pit around intake of sea water through conduit pipe of electric power cables → 16:05 Confirmed the water leakage from the pit to the sea → 18:45 Stopped the water leakage by casting concrete into the pit.

May 12 16:53 In addition to the plumbing pro-fire extinguishing, started core flooding from the plumbing pro-water supply.

May 15 14:33 ~ 17:00 Injected borated water to the Reactor Core.

May 17 18:04 ~ Started transfer of accumulated water in the basement of the turbine building to the Radioactive Waste Treatment Facilities

May 18 from around 16:30 Conducted preliminary survey in the Reactor Building for about 10 minutes.

May 25 09:10 Suspended transfer of accumulated water in the basement of the turbine building to the Radioactive Waste Treatment Facilities in order to check the transfer line and in the turbine building.

May 28 20:54 Terminated to inject water to the Reactor Core via Fire Extinguishing line.

May 31 09:00 ~ 16:00 A preliminary survey using a remote-controlled robot was carried out inside the reactor building.

May 31 10:19 Changed the rate of water injection into the Reactor Core from 13.5m$^3$/h to 12.5m$^3$/h.

June 1 10:10 Changed the rate of water injection into the Reactor Core from 12.5m$^3$/h to 11.5m$^3$/h.

June 2 12:50 ~ June 4 21:56 Transferred the accumulated water from the Condenser to the CST in order to prepare transferring of accumulated water in the basement of the turbine building.

June 3 13:16 ~ 13:32 Suspended the injection of coolant water due to the work for changing the route of water supply line to the Reactor Core.

June 5 18:26 ~ June 9 10:44 Transferred the accumulated water from inside the turbine building to the Condenser.

June 9 11:47 ~ 12:14 Entered into the reactor building and monitored radiation dose etc.

June 11 15:30 ~ June 12 17:01 Transferred the accumulated water from the basement of the turbine building to the Radioactive Waste Treatment Facilities.

June 14 10:05 ~ June 16 08:46 Started transfer of accumulated water in the basement of the turbine building to the Radioactive Waste Treatment Facilities.

June 14 13:02 ~ 13:31 Suspended water injection to replace the hose of water injection into the reactor.

June 18 13:31 ~ June 20 00:02 Transferred of accumulated water in the basement of the turbine building to the Radioactive Waste Treatment Facilities.

June 19 11:03 ~ 15:22 Due to preparation for the suspension works of the Okuma No.2 transmission line, the power supply for the water injection pump into the Reactor Core was temporarily switched to the diesel generator.

June 21 10:06 The water injection rate into the reactor was changed from about 11.0m$^3$/h to about 10.0m$^3$/h.


June 23 10:13 The water injection rate into the reactor was changed from about 10.0m$^3$/h to about 9.5m$^3$/h.

June 24 10:07 The water injection rate into the reactor was changed from about 9.5m$^3$/h to about 9.0m$^3$/h.

June 24 10:31 ~ 12:42 A radiation dose survey was carried out by a robot in the reactor building.

June 27 08:08 ~ 14:38 Due to preparation for the restoration works of the Okuma No.2 transmission line, the power supply for the water injection pump into the Reactor Core was temporarily switched to the diesel generator.

June 27 16:20 Started use of water treated in the water treatment facilities for injection into the reactor, in addition to water injection from the filtered water tank. Suspended supply of treated water because of a leakage from the pipe (17:55). Started the treated water transfer pump (June 28 14:36). Resumed of treated water (June 28 14:36).

June 27 17:00 ~ June 28 09:58 Started to transfer of accumulated water in the basement of the turbine building to the Radioactive Waste Treatment Facilities.
### Major Events after the Earthquake 3/3

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 29</td>
<td>10:59～13:33  Regarding the Circulating Injection Cooling of the Reactor Cores, supply of treated water was temporarily suspended due to leakage from a pipe for injection cooling.</td>
</tr>
<tr>
<td>June 30</td>
<td>08:56 ～ 10:43 Started transfer of the accumulated water in the basement of the turbine building to the Radioactive Waste Treatment Facilities. chrone test for primary line of the alternative cooling system for the Spent Fuel Pool. Trial operation was started. (18:33)</td>
</tr>
<tr>
<td>July 1</td>
<td>07:27 ～ Temporarily suspended supply of treated water into the reactor due to works to install and connect a buffer tank.</td>
</tr>
<tr>
<td>July 1</td>
<td>11:00 Started full-fledged operation of the alternative cooling system for the Spent Fuel Pool.</td>
</tr>
<tr>
<td>July 1</td>
<td>11:43 ～ 16:36 Carried out cleaning work in the reactor with a robot.</td>
</tr>
<tr>
<td>July 3</td>
<td>08:30 ～ 16:00 Installed 51 steel plates near the large object delivery entrance of the reactor building.</td>
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<tr>
<td>July 8</td>
<td>13:35 ～ 13:44 Workers entered the reactor building, and implemented a preliminary survey of the point for nitrogen injection.</td>
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<tr>
<td>July 9</td>
<td>15:22 Flushing was carried for the transfer line of the accumulated water from the basement of the turbine building to the Radioactive Waste Treatment Facilities.</td>
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<tr>
<td>July 14</td>
<td>20:01 Nitrogen injection started.</td>
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<tr>
<td>July 16</td>
<td>10:50～ Resumed transfer of the accumulated water in the basement of the turbine building to the Radioactive Waste Treatment Facilities.</td>
</tr>
<tr>
<td>July 18</td>
<td>08:30～14:40 July 19 08:30 ～ 15:00 Carried out installation work of temporary roof over the openings at the rooftop of the turbine building.</td>
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<tr>
<td>July 22</td>
<td>16:53～ Transferred the accumulated water in the basement of the turbine building to the Radioactive Waste Treatment Facilities.</td>
</tr>
<tr>
<td>July 23</td>
<td>03:24～11:45 The Alternative Cooling System for the Spent Fuel Pool of Unit 3 was temporarily suspended due to the restoration work of Yonomori line for duplication of line.</td>
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</table>

-Water spray over the Spent Fuel Pool by Concrete Pump Truck (Fresh water)-

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>March 29</td>
<td>14:17～18:18, March 31 16:30～19:33, April 2 09:52～12:54, April 4 17:03～19:19, April 7 06:53 ～ 08:53, April 8 17:06～20:00, April 10 17:15～19:15, April 12 16:26～17:16, April 14 15:56～16:32, April 18 14:17～15:02, April 22 14:19～15:40, April 26 12:25～14:02</td>
</tr>
<tr>
<td>May 8</td>
<td>12:10～14:10, May 9 12:14～15:00 (12:39 ～14:36 Hydrazine was also injected), May 16 15:00～18:32 (15:10 ～17:30 Hydrazine was also injected), May 24 10:15～13:35 (10:20～12:56 Hydrazine was also injected), May 28 13:28～15:08 (13:42 ～14:40 Hydrazine was also injected), June 1 14:34～15:54 (14:41 ～15:26 Hydrazine was also injected), June 5 13:08～15:14 (13:14～14:16 Hydrazine was also injected), June 9 13:42～15:31 (13:45～14:40 Hydrazine was also injected), June 13 10:09～11:48 (10:13～11:36 Hydrazine was also injected), June 17 10:19～11:57 (10:23～11:31 Hydrazine was also injected), June 26 09:56～11:23 (Borated water was injected), June 27 15:00～17:18 (Borated water was injected), June 29 14:45～15:53</td>
</tr>
</tbody>
</table>

-Cooling by the alternative cooling system for the Spent Fuel Pool-

- July 1 11:00 ～ July 8 08:20, July 8 14:24 ～ July 21 8:02, July 21 14:52～July 22 07:10, July 22 11:50 ～ July 23 03:24, July 23 11:45～
External Power

EDG*2

no fuel inside the Reactor Core

Spent Fuel Pool Water Temperature  83°C
*Described temporary thermo-couple readings (As of 15:30, July 20)

Spent Fuel Pool Cooling System

In periodic inspection outage

RHRS*1

No heat removal is necessary as no fuel is in RPV

Current Conditions: No fuel is in RPV*3. Fresh water is being injected to the Spent Fuel Pool.

Spraying freshwater by temporary water spraying equipment

Major Events after the Earthquake 1/2

In periodic inspection outage when the earthquake occurred
March 14  04:08 Water temperature in the Spent Fuel Pool (SFP), 84°C
March 15  06:00～around 06:10 Confirmed the partial damage of wall in the 4th floor.
March 15  09:38 Fire occurred in the 3rd floor. (12:25 extinguished)
March 16  05:45 Fire occurred. TEPCO couldn’t confirm any fire on the ground. (06:15)
March 20  08:21～09:40 Water spray over SFP by Self-Defense Force
March 20  18:30～19:46 Water spray over SFP by Self-Defense Force
March 21  06:37～08:41 Water spray over SFP by Self-Defense Force
March 21  around 15:00 Work for laying cable to Power Center was completed.
March 22  10:35 Power Center received electricity.
March 25  06:05～10:20 Sea water injection to SFP via the Fuel Pool Cooling Line (FPC)
March 29  11:50 Lighting in the Central Control Room was recovered.
April 11  around 17:16 An earthquake occurred (at Hamadori in Fukushima Prefecture).
April 12  12:00～13:04 Sampled the water in SFP.
April 19  10:23 Completed the work of strengthening connection of the power supplies between Units 1-2 and Units 3-4.
April 22  Measured the water level of SFP by a gauge hung on Concrete Pump Truck (62m class).
April 30  11:34 Completed reinforcement work of the power supply both Units 3, 4. (Increasing the voltage from 6.6kv to 66kv)
May 9  Started installation work of the supporting structure for the floor of SFP
June 10  around 14:00～(about 30 minutes) Workers entered the RB and conducted a survey of working environment for the construction work on the SFP circulating cooling system.
June 29  13:28～14:21 Workers entered the RB and conducted a survey of working environment for the construction work on the SFP circulating cooling system.
July 6  10:20～10:30 Carried out preparation for installation work of the alternative cooling system for the Spent Fuel Pool.
July 8  10:00～11:30 Regarding the installation works of the alternative cooling system for the Spent Fuel Pool, the examination of the integrity of the pipes was conducted.

*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Reactor Pressure Vessel
<Water spray by Concrete Pump Truck (Seawater)>

<Water spray by Concrete Pump Truck (Fresh water)>
March 30 14:04-18:33, April 1 08:28-14:14, April 3 17:14-22:16, April 5 17:35-18:22, April 7 18:23-19:40, April 9 17:07-19:24, April 13 00:30-6:57, April 15 14:30-18:29, April 17 17:39-21:22, April 19 10:17-11:35, April 20 17:08-20:31, April 21 17:14-21:20, April 22 17:52-23:53, April 23 12:30-16:44, April 24 12:25-17:07, April 25 18:15-April 26 0:26, April 26 16:50-20:35, April 27 12:18-15:15, May 5 12:29-20:46, May 6 12:38-17:51, May 7 14:05-17:30, May 9 16:05-19:05 (16:11-18:38 Hydrazine was also injected), May 11 16:07-19:38 (16:14-19:36 Hydrazine was also injected), May 13 16:04～19:04 (16:20-18:41 Hydrazine was also injected), May 15 16:25-20:25 (16:26-18:30 Hydrazine was also injected), May 17 16:14-20:06 (16:40-18:35 Hydrazine was also injected), May 19 16:30-19:30, May 21 16:00-19:56 (16:23 -19:00 Hydrazine was also injected), May 23 16:00-19:09 (16:08-18:30 Hydrazine was also injected), May 25 16:36-20:04 (16:42-18:49 Hydrazine was also injected), May 27 17:05-20:00 (16:24 -18:53 Hydrazine was also injected), May 28 17:56-19:45 (18:02-19:45 Hydrazine was also injected), June 3 14:35-21:15 (14:44-18:58 Hydrazine was also injected), June 4 14:23-19:45 (14:51-18:41 Hydrazine was also injected), June 6 15:56-18:35 (16:15-17:45 Hydrazine was also injected), June 8 16:12-19:41 (16:16-18:05 Hydrazine was also injected), June 13 16:36-21:00 (16:38-19:15 Hydrazine was also injected), June 14 16:10～20:52 (16:11～19:15 Hydrazine was also injected)

<Water spray by temporary water spraying equipment (Fresh water)>
June 16 13:14～15:44 (13:48～15:18 Hydrazine was also injected), June 18 16:05～19:23 (16:29～18:33 Hydrazine was also injected), June 22 14:31～16:38, June 30 11:30～11:55

<Water filling to the reactor well and temporary storage pool (DSP)>
June 19 09:14～11:57, June 20 09:49～09:52, June 20 10:06～June 21 11:29, June 21 11:45～12:52,
Conditions of Fukushima Dai-ichi Nuclear Power Station  
**Unit 5**  
(Ass of 12:00 July 24, 2011)

**In periodic inspection outage**

- Water Temperature in the Pool: 28.1°C  
- Condition: Recovery of heat removal function

**Spent Fuel Pool Cooling System**  
Removing heat through existing cooling system.

**External Power**  
Two lines secured

**EDG*2**  
Share two EDGs of Unit 6, Two EDGs of Unit 5 standby mode

**RHRS*1**  
Removing heat through Residual Heat Removal System.

**Reactor Pressure Vessel**  
Temperature: Monitoring by Reactor Water Temperature

- Reactor Pressure: 0.113 MPa*  
- Reactor Water Level: 1,682 mm  
- Reactor Water Temperature: 29.2°C  
- Condition: Pressure is under control.  
*converted to absolute pressure

**Major Events after the Earthquake 1/2**

- March 20 14:30 Cold shutdown  
- March 21 11:36 Receiving electricity from external power supply  
- March 23 17:24 Pump for Residual Heat Removal Seawater System (RHRS) was automatically stopped when the power supply was switched from the temporary to the permanent.  
- March 24 16:14 Repair of the RHRS pump was completed.  
- March 24 16:35 Started to cooling.

- April 5 17:25〜 April 8 12:14 Discharged the groundwater with low-level radioactivity in the Sub Drain Pit to the sea (around 950 ton).  
- April 25 12:22 〜 16:43 For reinforcement work of the power supply, the pump for Residual Heat Removal (RHR) was temporarily stopped.  
- April 25 14:44 〜 17:38 Implemented reinforcement work of the power supply (connection of the power supplies between Units 1-2 and Units 5-6).

- May 2 12:00 〜 15:03 The pump for RHR was temporarily shut off in order to test the Start-up Transformer for power reception.

- May 28 around 21:14 Confirmed shutdown of the RHRS pump  
- May 29 08:12 Started to replace with the temporary RHRS Spare Pump  
- May 29 12:31 Started the RHRS Pump  
- May 29 12:49 Started to cool the Reactor Core by RHR

- June 8 08:46〜12:35 RHRS pump etc were temporary stopped due to the installation of one more pump for RHRS.  
- June 24 16:35 Cooling of the Spent Fuel Pool was started using the Fuel Pool Cooling and Clean-up System.

- June 27 18:03 EDG(5A) recovery to standby mode.
- June 28 12:32 EDG(5B) recovery to standby mode.
- June 30 10:02 〜 11:48 Temporarily suspended RHR pump due to switching power supply of the ancillary equipment.

- July 3 10:00 〜 13:36 Temporarily suspended RHR pump due to the work for exchanging the outlet (10:20 〜 13:22, the temporary pump of RHRS (B) was temporarily suspended)

- July 3 10:15 〜 13:40 The pump of RHRS was temporarily suspended

- July 11 Due to restoration work of Yonomori line for duplication of line, D/G5A started up (03:03) and shut off (09:07). D/G5B started up (03:37) and shut off (14:44).

- July 11 5:01〜13:44 Due to restoration work of Yonomori line for duplication of line, the power supply from the Yonomori line was suspended.

- July 13 6:30〜10:58 Temporarily suspended RHR pump operation due to the work for exchanging RHRS pump horse

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)
Major Events after the Earthquake 2/2

July 15 Implemented trial run of the pump of RHRS (D) (10:16). The pump of RHR (C) shut off (14:25). The pump of RHR (D) started up (14:45).
July 16 Due to restoration work of Yonomori line for duplication of line, D/G5B started up (04:01) and shut off (13:05).
July 16 05:28～12:05 Due to restoration work of Yonomori line for duplication of line, the power supply from the Yonomori line was temporarily suspended.
July 17 Due to restoration work of Yonomori line for duplication of line, D/G5B started up (03:08)
July 17 04:24～13:20 Due to restoration work of Yonomori line for duplication of line, the power supply from the Yonomori line was temporarily suspended.
In periodic inspection outage

Water Temperature in the Pool: 40.0℃
Condition: Recovery of heat removal function.

Removing heat alternately from the water in the reactor and in the spent fuel pool.

Spent Fuel Pool Cooling System

Reactors Pressure Vessel Temperature: Monitoring by Reactor Water Temperature

Reactors Pressure: 0.124MPa*
Reactors Water Level: 2,153mm
Reactors Water Temperature: 47.6℃
Condition: Pressure is under control.
*converted to absolute pressure

External Power
EDG*2
RHRS*1

Two lines secured
Two EDGs

*1 Residual Heat Removal System
*2 Emergency Diesel Generator

March 20 19:27 Cold shutdown
March 22 19:17 Receiving electricity from external power supply
April 4 21:00～April 9 18:52 Discharged the groundwater with low-level radioactivity in the Sub Drain Pit to the sea (around 373 ton).
April 19 11:00～15:00 Transferred accumulated water under the base of the turbine building to the condenser.
April 20 09:51～15:56 The pump for Residual Heat Removal (RHR) was temporarily stopped in order to change the position of the hose of the temporary RHR Seawater System.
April 25 14:44～17:38 Implemented reinforcement work of the power supply (connection of the power supplies between Units 1-2 and Units 5-6).
May 2 11:03～15:03 The pump for RHR was temporarily shut off in order to test the Start-up Transformer for power reception.
June 28 around 12:00 Confirm a leakage of water in a low radioactive concentration from the temporarily tank which stored accumulate water from the basement of the turbine building.
July 11 Due to restoration work of Yonomori line for duplication of line, D/G6A started up (04:17) and shut off (15:42). DG6B started up (04:31) and shut off (16:36).
July 11 05:01 ～13:44 Due to restoration work of Yonomori line for duplication of line, the power supply from the Yonomori line was temporarily suspended.
July 16 Due to restoration work of Yonomori line for duplication of line, D/G6B started up (04:21) and shut off (13:51).
July 16 05:28 ～12:05 Due to restoration work of Yonomori line for duplication of line, the power supply from the Yonomori line was temporarily suspended.
July 17 Due to restoration work of Yonomori line for duplication of line, D/G6B started up (03:28).
July 17 04:24 ～13:20 Due to restoration work of Yonomori line for duplication of line, the power supply from the Yonomori line was temporarily suspended.
July 19 08:03 ～9:08 RHRS pumps (A) and (B) were temporarily stopped due to replacement of backing rubber of suspension wire around the pumps.

(Transferred accumulated water on the basement floor of the turbine building to the temporary tank.)
May 1 14:00～17:00, May 2 10:00～16:00, May 3 14:00～17:00, May 6 14:00～17:00, May 7 10:00～15:00, May 9 14:00～17:00, May 10 10:00～16:00, May 11 10:00～16:00, May 12 10:00～16:00, May 13 10:00～15:00, May 14 10:00～15:00, May 15 10:00～15:00, May 16 10:00～14:00, May 17 10:00～14:00, May 18 10:00～14:00, May 21 14:00～18:00, May 24 09:00～19:00, May 25 09:00～19:00, May 26 09:00～19:00, May 27 09:00～19:00, May 28 09:00～19:00,
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>May 29</td>
<td>09:00 ~ 19:00</td>
<td>Transferred accumulated water on the basement floor of the reactor building to the Radioactive Waste Treatment Building</td>
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<td>May 30</td>
<td>10:00 ~ 17:30</td>
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<tr>
<td>June 2</td>
<td>14:00 ~ (June 5 14:00 ~ 14:45 temporarily suspended) ~ June 8 18:00, June 9 09:00 ~ 18:00, June 11 10:00 ~ 15:00, June 12 10:00 ~ 15:00, June 13 10:00 ~ 16:00, June 14 10:00 ~ 16:00, June 15 10:00 ~ 16:00, June 16 10:00 ~ 16:00, June 17 10:00 ~ 16:00, June 18 10:00 ~ 16:00, June 19 10:00 ~ 16:00, June 20 10:00 ~ 16:00, June 21 10:00 ~ 16:00, June 22 10:00 ~ 16:00, July 1 10:00 ~ July 3 16:00, July 4 10:00 ~ 16:00, July 5 10:30 ~ 16:30, July 6 10:00 ~ 17:00, July 7 10:30 ~ 16:30, July 8 10:30 ~ 16:30, July 9 10:30 ~ 16:30, July 11 10:30 ~ 16:30, July 21 11:00 ~ July 22 18:00, July 23 11:00 ~ July 24 11:00 ~</td>
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<tr>
<td>March 10</td>
<td>11:00 ~ 12:30</td>
<td>Transferred accumulated water from the temporary tank to the Mega-Float</td>
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<td>March 11</td>
<td>11:00 ~ 12:30</td>
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<td>March 12</td>
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<td>July 6</td>
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