From:	LIA07 Hoc
Sent:	Wednesday, March 30, 2011 6:32 AM
To:	LIA07 Hoc; Borchardt, Bill; Bradford, Anna; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject:	Updates for Go Book - 0630 EDT March 30, 2011
Attachments:	NRC Status Update 3.30.11--0430.pdf; ET Chronology 3-30-11 0600.pdf; TEPCO Press Release 214.pdf; TEPCO Press Release 215.pdf; TEPCO Press Release 212.pdf; TEPCO Press Release 213.pdf

Please find attached updated information for the "Go Books."

The updates include:

- The latest Status Update (0430 EDT, March 30, 2011)
- The latest ET Chronology
- The latest TEPCO Press Releases (212-215)

Please let me know if you have any questions or concerns.

-Jim

Jim Anderson
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Press Releases

Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 21st, 23rd to 28th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater

Press Releases

Press Release (Mar 30,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

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Press Release (Mar 30,2011)
Implementation Plan of Rolling Blackouts on and after March 31, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after March 30, 2011 as follows:

o Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow.
We appreciate your continuous cooperation

o Implementation plan of rolling blackouts on April 1 (Fri)-April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
oPrediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

oPrediction of demand and supply on March 31
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Releases

Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix: The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Press Releases

Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 21st, 23rd to 28th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater

around discharge canal of Unit 1, 2, 3 and 4.

* On March 20th, 21st, 23rd to 28th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station.

* Plutonium has detected from the sample of soil at the site of Fukushima Daiichi Nuclear Power Station collected on 21st and 22nd of March, Concentration level of Plutonium detected was same as that of under usual environment and it is thought not to be harmful to human health. We will strengthen environmental monitoring of power station and surrounding environment.

* On March 28th, we detected radioactive materials contained in the puddles found in the turbine building of Unit 1 to 4.

* At approximately 3:30 pm, March 27th, we found water pooling in the vertical shaft of the trench outside of the turbine buildings for Units 1 to 3. The radiation dose at the surface of the water amounted 0.4 mSv/h in Unit 1 and over 1,000 mSv/h in Unit 2. We could not confirm the amount of the radiation dose in Unit 3. We will keep observing the condition of the water in the vertical shaft.

* At 12:03 pm, March 29th, when taking off the flange of the pipe to remove the residual heat in the seawater system, 3 workers from other companies received water in the pipe. Mopping up water, we confirmed no radioactive material had adhered to their bodies.

* We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:
Units 1 to 4: shutdown due to the earthquake
* The national government has instructed evacuation for those local residents within 10km radius of the periphery.

* In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

* Since March 12th, we had been preparing measures for reducing the pressure of reactor containment vessels (partial discharge of air containing radioactive materials to outside), but on March 17th, we stopped such preparation in all Units.

* (Unit 1)
As it is confirmed that the temperature of the Emergency Equipment Cooling Water System *1 has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

* (Unit 4)
As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

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

Kashiwazaki Kariwa Nuclear Power Station:
Units 1, 5, 6, 7: normal operation
(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]
- Hirono Thermal Power Station Units 2 and 4: shutdown due to the earthquake
- Hitachinaka Thermal Power Station Unit 1: shutdown due to the earthquake
- Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to the earthquake

[Hydro Power Station]
- All the stations have been restored.
(Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Transmission System, etc.]
- All substation failed due to the earthquake have been restored.
(Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Power Supply to TEPCO's Service Areas]
- Except in case of planned rolling blackouts, we can supply electricity to our all service areas.

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]
- Considering the critical balance of our power supply capacity and expected power demand forward, in order to avoid unexpected blackout, TEPCO has been implementing rolling blackout (planned blackout alternates from one area to another) since Mar 14th. We will make our utmost to secure the stable power supply as early as possible. For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Others]
- Please do NOT touch cut-off electric wires.
- In order to prevent fire, please make sure to switch off the electric appliances such as hair driers when you leave your house.
- For the customer who has in-house power generation, please secure fuel for generator.

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Press Releases

Press Release (Mar 30,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

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Press Releases

Press Release (Mar 30,2011)
Implementation Plan of Rolling Blackouts on and after March 31, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after March 30, 2011 as follows:

○ Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow.
We appreciate your continuous cooperation

○ Implementation plan of rolling blackouts on April 1 (Fri)-April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
○Prediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

○Prediction of demand and supply on March 31
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Releases

Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix:The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Press Releases

Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 21st, 23rd to 28th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater

Press Releases

Press Release (Mar 30,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

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Press Releases

Press Release (Mar 30,2011)
Implementation Plan of Rolling Blackouts on and after March 31, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after March 30, 2011 as follows:

o Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow.
We appreciate your continuous cooperation

o Implementation plan of rolling blackouts on April 1 (Fri)- April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
oPrediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

oPrediction of demand and supply on March 31
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Releases

Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix:The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Press Releases

Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 21st, 23rd to 28th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater

Press Releases

Press Release (Mar 30,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

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Press Release (Mar 30,2011)
Implementation Plan of Rolling Blackouts on and after March 31, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after March 30, 2011 as follows:

o Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow.
We appreciate your continuous cooperation

o Implementation plan of rolling blackouts on April 1 (Fri)-
April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
oPrediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

oPrediction of demand and supply on March 31
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix:The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 21st, 23rd to 28th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater

around discharge canal of Unit 1, 2, 3 and 4.

* On March 20th, 21st, 23rd to 28th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station.

* Plutonium has detected from the sample of soil at the site of Fukushima Daiichi Nuclear Power Station collected on 21st and 22nd of March, Concentration level of Plutonium detected was same as that of under usual environment and it is thought not to be harmful to human health. We will strengthen environmental monitoring of power station and surrounding environment.

* On March 28th, we detected radioactive materials contained in the puddles found in the turbine building of Unit 1 to 4.

* At approximately 3:30 pm, March 27th, we found water pooling in the vertical shaft of the trench outside of the turbine buildings for Units 1 to 3. The radiation dose at the surface of the water amounted 0.4 mSv/h in Unit 1 and over 1,000 mSv/h in Unit 2. We could not confirm the amount of the radiation dose in Unit 3. We will keep observing the condition of the water in the vertical shaft.

* At 12:03 pm, March 29th, when taking off the flange of the pipe to remove the residual heat in the seawater system, 3 workers from other companies received water in the pipe. Mopping up water, we confirmed no radioactive material had adhered to their bodies.

* We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:
Units 1 to 4: shutdown due to the earthquake
* The national government has instructed evacuation for those local residents within 10km radius of the periphery.

* In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

* Since March 12th, we had been preparing measures for reducing the pressure of reactor containment vessels (partial discharge of air containing radioactive materials to outside), but on March 17th, we stopped such preparation in all Units.

* (Unit 1)
As it is confirmed that the temperature of the Emergency Equipment Cooling Water System *1 has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

* (Unit 4)
As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

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

Kashiwazaki Kariwa Nuclear Power Station:
Units 1, 5, 6, 7: normal operation
(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]
- Hirono Thermal Power Station Units 2 and 4: shutdown due to the earthquake
- Hitachinaka Thermal Power Station Unit 1: shutdown due to the earthquake
- Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to the earthquake

[Hydro Power Station]
- All the stations have been restored.
(Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Transmission System, etc.]
- All substation failed due to the earthquake have been restored.
(Facilities damaged by the earthquake are now being repaired in a timely manner.)

Press Releases

Press Release (Mar 30,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

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Press Releases

Press Release (Mar 30,2011)
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o Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow. We appreciate your continuous cooperation

o Implementation plan of rolling blackouts on April 1 (Fri)- April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
oPrediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

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Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix:The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 21st, 23rd to 28th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater

Press Releases

Press Release (Mar 30,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

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Press Release (Mar 30,2011)
Implementation Plan of Rolling Blackouts on and after March 31, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after March 30, 2011 as follows:

o Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow.
We appreciate your continuous cooperation

o Implementation plan of rolling blackouts on April 1 (Fri)-April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
oPrediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

oPrediction of demand and supply on March 31
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix: The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
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- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
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- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
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- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
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the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
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* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
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Press Releases

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Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
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We will inform the implementation plan of rolling blackouts on and after March 30, 2011 as follows:

o Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow.
We appreciate your continuous cooperation

o Implementation plan of rolling blackouts on April 1 (Fri)-
April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
oPrediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

oPrediction of demand and supply on March 31
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Releases

Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix:The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Press Releases

Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 21st, 23rd to 28th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater

Press Releases

Press Release (Mar 30,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

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Press Releases

Press Release (Mar 30,2011)
Implementation Plan of Rolling Blackouts on and after March 31, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after March 30, 2011 as follows:

o Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow.
We appreciate your continuous cooperation

o Implementation plan of rolling blackouts on April 1 (Fri)-April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
oPrediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

oPrediction of demand and supply on March 31
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Releases

Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix:The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 21st, 23rd to 28th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater

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Press Releases

Press Release (Mar 30,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 30th)

[No update from the last release issued at 9:00 pm, March 29th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
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4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

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Press Releases

Press Release (Mar 30,2011)
Implementation Plan of Rolling Blackouts on and after March 31, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after March 30, 2011 as follows:

○ Implementation plan of rolling blackout on March 31 (Thu.)
On March 31, Thursday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 31 and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow. We appreciate your continuous cooperation

○ Implementation plan of rolling blackouts on April 1 (Fri)-April 6 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
○Prediction of demand and supply on March 30
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

○Prediction of demand and supply on March 31
Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 31 will be normal. We assume the estimated peak demand on March 31 will be 34,000MW, equal to the estimated demand today on March 30.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Releases

Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

We intend to conduct the sampling and analysis for Units 2 to 4 on the same part. As soon as we have the result, we will inform you.

Appendix:The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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Press Releases

Press Release (Mar 30,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power was connected to Unit 1 to 6.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.

- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 0:19 pm on March 25th. From 4:30 PM, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31pm, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th , the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th,

the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.

* Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

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Press Releases

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[No update from the last release issued at 9:00 pm, March 29th]

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Press Releases

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o Implementation plan of rolling blackout on March 31 (Thu.)
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o Implementation plan of rolling blackouts on April 1 (Fri)- April 6 (Wed)
Please refer to the appendix for details.

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- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
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Estimated Demand 34,000 MW (18:00-19:00)
Supply Capacity 38,000 MW

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Supply Capacity 38,000 MW

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Appendix:Weekly Rolling Blackout Tentative Plan from Mar 31(Thu)

to April 6(Wed)(PDF 17.3KB)

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Press Releases

Press Release (Mar 30,2011)
The status of water analysis in the trench of Fukushima Daiichi Nuclear Power Station

As to the water found in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station, we conducted the sampling on Mar 29th. Today, we informed NISA and Fukushima prefecture of the result of the nuclide analysis attached as the appendix.

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Appendix:The result of the nuclide analysis of water in the trench of Unit 1, Fukushima Daiichi Nuclear Power Station

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From: Stahl, Eric
Sent: Wednesday, March 30, 2011 4:55 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Emche, Danielle
Subject: Traveler Information

Steve -

Can you please send me the document with all of the NRC travelers information (departure dates, return dates, etc.).

Thanks,
Eric

QQQ/198

From: LIA07 Hoc
Sent: Wednesday, March 30, 2011 4:43 AM
Cc: LIA07 Hoc
Subject: 0430 EDT (March 30, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: NRC Status Update 3.30.11--0430.pdf

Attached, please find a 0430 EDT (March 30, 2011) status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

Please note that this information is "Official Use Only" and is only being shared within the federal family.

Please call the Headquarters Operations Officer at 301-816-5100 with questions.

-Jim

Jim Anderson
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)
james.anderson@nrc.gov

add 199

From: Hoc, PMT12
Sent: Wednesday, March 30, 2011 3:29 PM
To: PMT11 Hoc
Subject: FW: Per conversation

Can you please provide Mr. Rihm with any update to the statement below based on the current release situation at the site.

Note due date.

From: Rihm, Roger
Sent: Wednesday, March 30, 2011 3:24 PM
To: Hoc, PMT12
Subject: FW: Per conversation

From: Rihm, Roger
Sent: Wednesday, March 30, 2011 3:21 PM
To: 'hoc.pmt12@nrc.gov'
Subject: Per conversation

Sandra, I need to update 3/29/11 Borchardt congressional testimony for use by Virgilio or Leeds on 4/6/11. One sentence reads as follows:

"Natural background radiation from sources such as rocks, the sun, and buildings, is 100,000 times more than the doses attributed to any level of the radiation from this event that has been detected in the U.S. to date."

I need to verify or change this statement, as appropriate, based on current information (so that testimony can go to the Commission for review tomorrow). I guess I will have to check back early next week to see if there has been any change between now and then.

Can I get a response by 3PM tomorrow (3/31/11)?

Thank you and keep up the good work!

Roger S. Rihm
Communications and Performance Improvement Staff
Office of the Executive Director for Operations
US NRC
301.415.1717
roger.rihm@nrc.gov

From: Hoc, PMT12
Sent: Wednesday, March 30, 2011 10:29 PM
To: PMT03 Hoc
Subject: FW: Per conversation

From: PMT09 Hoc
Sent: Wednesday, March 30, 2011 10:17 PM
To: Rihm, Roger
Cc: Hoc, PMT12; FOIA Response.hoc Resource
Subject: RE: Per conversation

In a release dated 03/22/2011, the EPA Press Office, in a press release dated 03/22/2011, made the following statement:

"In a typical day, Americans receive doses of radiation from natural sources like rocks, bricks and the sun that are about 100,000 times higher than what we have detected coming from Japan."

This appears to be the source of the information that Mr. Borchardt. The EPA provided an update on March 31, 2011, which stated:

***WASHINGTON** – During detailed filter analyses from 12 RadNet air monitor locations across the nation, the U.S. Environmental Protection Agency (EPA) identified trace amounts of radioactive isotopes consistent with the Japanese nuclear incident. Some of the filter results show levels slightly higher than those found by EPA monitors last week and a Department of Energy monitor the week before. These types of findings are to be expected in the coming days and are still far below levels of public health concern.*

EPA Radnet is a system of environmental radiation monitors. We do not know the basis of the EPA's March 22 estimate of "about 100,000," but based on the EPA's above statement of a slightly higher levels, you may wish either attribute the statement to EPA or update the statement to read:

The Environmental Protection Agency has analyzed data obtained from environmental airborne concentrations collected by the EPA's RadNet U.S. system and reported that, although trace amounts of radioactive isotopes consistent with the Japanese nuclear incident have been detected, these levels are still far below levels of public health concern.

http://www.epa.gov/japan2011/index.html

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Sent: Wednesday, March 30, 2011 4:01 PM
To: PMT09 Hoc
Subject: FW: Per conversation

From: Rihm, Roger
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To: Hoc, PMT12
Subject: FW: Per conversation

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Roger S. Rihm
Communications and Performance Improvement Staff
Office of the Executive Director for Operations
US NRC
301.415.1717
roger.rihm@nrc.gov

From: LIA02 Hoc
Sent: Thursday, March 31, 2011 6:39 PM
To: Collins, Elmo
Cc: LIA03 Hoc
Subject: your BB phone# and emergency contact list

Hi Elmo - Could you please reply all to this email and send your BB phone number, and an "in case of Emergency contact" for you to include:

Name of emergency contact,
Phone #,
Email address
US mail address

And if you have your flight information, your arrival date in Japan and your expected departure date.

Thank you.
Mugeh
On behalf of the International Liaison Team

QQQ/201

From: LIA02 Hoc
Sent: Thursday, March 31, 2011 6:12 PM
To: LIA03 Hoc
Subject: FW: DART Deployment Schedule 3.31.11
Attachments: DART Deployment Schedule 03.31.11.xlsx

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Thursday, March 31, 2011 3:33 PM
To: LIA01 Hoc; LIA02 Hoc; McDermott, Brian; Marshall, Jane
Cc: Kozal, Jason; Trocine, Leigh; Dudek, Michael; Kowalczik, Jeffrey
Subject: FW: DART Deployment Schedule 3.31.11

FYI

From: RMTPACTSU_AC
Sent: Thursday, March 31, 2011 3:21 PM
To: DART_PACTSU; RMT_PACTSU
Subject: DART Deployment Schedule 3.31.11

Attached is the DART Deployment Schedule as of March 31, 2011 (Washington DC). Please let me know if there are any questions or concerns.

Surin McKenna
Admin Coordinator
Pacific Tsunami and Japan Earthquake Response Management Team
USAID/DHCA/OFDA
Rmtpactsu_ac@ofda.gov
202-712-0031

0000/202

Pacific Tsunami DART

9/19/2011 10:00

Departure times are local

Arrival times are local

DART	Name	Current Location	Departure	Arrival	NOTES	Total Days
Team Leader	Bill Berger	Tokyo, Japan		BMI 0771 @1610	TBD	20
Admin Coordinator	Natalya Johnson	Tokyo, Japan		UA 897 @1635	ETD 4/7	13
Admin Coordinator	Surin McKenna	Washington DC	UA 804 @1600	UA 803 @1510	ETA 4/4	2
Communications Officer	Marco Rivera	Tokyo, Japan		KE701 @1125	ETD 4/8	19
Information Officer	Erin Magee	Tokyo, Japan		GA 884 @0900	ETD 4/5	21
Information Officer	Alison Lapp	Washington DC	UA 890 @1700	UA 891 @1635	ETA 4/3	2
Deputy Team Leader	Courtney Brown	Tokyo, Japan		TG 676 @1600	TBD	18
DOE Liaison	Alan Remick	Tokyo, Japan		UA 0897 @1635	ETD 4/6	20
DOE Officer	Mark Breitinger	Tokyo, Japan	UA 804 @1600	AF 278 @2145	ETD 4/12	7
DOE Officer	David Bowman	Virginia, USA	UA 804 @1600	UA 803 @1510	ETA 4/3	2
DOE Officer	Christopher Smith	Virginia, USA	UA 804 @1600	UA 803 @1510	ETA 4/3	2
DOE Officer	Mark Breitinger	Tokyo, Japan		AF 278 @2145	ETD 4/12	7
NRC Emergency Coordinator	Chuck Casto	Tokyo, Japan	AA 176 @1310	AA 0175 @1330	ETD TBD	17
NRC Officer	John Monninger	Tokyo, Japan	UA 804 @1600	BA 0005 @0910	ETD 4/7	17
NRC Officer	Tony Nakanishi	Tokyo, Japan	UA 804 @1600	BA 0005 @0910	ETD 4/1	17
NRC Officer	William Cook	Tokyo, Japan	AA 176 @1310	BA 0005 @0910	ETD 4/1	17
NRC Officer	Daniel Dorman	Tokyo, Japan	UA 9682 @1105	UA 0897 @1635	ETD 4/3	13
NRC Officer	Alan Blamey	Tokyo, Japan		AA 1673 @1530	ETD 4/6	9
NRC Officer	Michael Scott	Tokyo, Japan		UA 0897 @1635	ETD 4/6	10
NRC Officer	Todd Jackson	Tokyo, Japan		AA 0153 @1415	ETD 4/6	9
NRC Officer	Abdul Sheikh	Tokyo, Japan		UA 0897 @1635	ETD 4/7	8
NRC Officer	Robert Taylor	Tokyo, Japan		UA 0897 @1635	ETD 4/7	8
NRC Officer	Marie Miller	Tokyo, Japan		AA 153 @1415	ETD 4/7	8
NRC Officer	Syed Ali	Tokyo, Japan		UA 0897 @1635	ETD 4/6	8
NRC Officer	Ralph Way	Tokyo, Japan		UA 0897 @1635	ETD 4/7	8
NRC Officer	Jack Geisner	Tokyo, Japan		AA 0153 @1415	ETD 4/7	8
NRC Officer	Danielle Emche	Tokyo, Japan		UA 0803 @1322	ETD 4/12	4
NRC Officer	Eric Stahl	Tokyo, Japan		UA 0803 @1221	ETD 4/11	3
NRC Officer	Michel Cali	Washington DC			ETD 4/3	2
NRC Officer	Rudolph Bernhard	Marietta, GA			ETD 4/3	2
NRC Officer	Michael Hay	Mansfield, TX			ETD 4/3	2
NRC Officer	Michael Saloy				ETD 4/3	2
NRC Officer	Elmo Collins	Tokyo, Japan		AA 0175 @1305	ETD 4/13	3
MLU Officer	Bill Laspina	Tokyo, Japan		UA 0837 @1540	ETD 3/31	13
MLU Officer	Toni Bock	Yokota AFB, Japan		TK 0050 @1230	ETD 4/12	20
MLU Officer	Thomas Frey	Yokota AFB, Japan		UA 0837 @1540	ETD 4/5	17
MLU Officer	Steve Katz	Washington DC		UA 803 @1510	ETD 5/1	2
Deputy Team Leader for Tech Team and	Joe Hughart	Tokyo, Japan		UA 0881 @1725	ETD 4/11	20
Deputy Team Leader for Tech Team and	Timothy Jiggens	San Francisco, CA	AA 170 @1525	AA 5846 @1655	ETA 4/8	2
HHS Officer *	Jana Telfer	Tokyo, Japan				6
HHS Officer *	Thomas Bowman	Tokyo, Japan				6
HHS Officer *	Norman Coleman	Tokyo, Japan				6
					Daily TOTAL DART	

	MARCH																							APRIL																							MAY						
	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat
	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7
Daily TOTAL DART	0	1	4	7	7	13	13	13	14	15	16	16	18	19	25	30	30	31	32	33	33	2	3	8	1	2	4	8	2	0	0	2	4	0	0	0	4	0	0	0	0	0	2	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0

* Three HHS Officers (not funded by USAID/DCHA/OFDA) working under the DART organization but with full reporting responsibilities to the Department of State

Pacific Tsunami DART

9/19/2011 10:00

Departure times are local

Arrival times are local

DART	Name	Current Location	Departure	Arrival
Admin Coordinator	Sarah Potts	Back in U.S.		Missawa @1522
Logistics Officer	Travis Betz	Back in U.S.		QF 0021 @0605
Operations Coordinator	Dewey Perks	Back in U.S.		Missawa @1522
Press Officer	Dave Stone	Back in U.S.		Missawa @1522
Field Officer	Amy Sink	Tokyo, Japan	UA 804 @1600	AA5835 @1605

NRC	Name	Current Location	Departure	Arrival
NRC Officer	Tim Kolb	Back in U.S.	No Info	BA 0005 @0910
NRC Liaison	James Trapp	Back in U.S.	No Info	UA 9681 @2225
NRC Officer	Richard Devercelly	Back in U.S.	AA 176 @1310	DL 0275 @1615
NRC Liaison	Anthony Ulses	Back in U.S.	No Info	Missawa @1522
NRC Officer	Jack Foster	Back in U.S.	UA 804 @1600	BA 0005 @0910
NRC Officer	Angela Coggins	Back in U.S.	No Info	VA 900 @1345
NRC Officer	Gregory Jaczko	Back in U.S.	No Info	VA 900 @1345
NRC Officer	Kirk Foggie	Back in U.S.	UA 804 @1600	BA 0005 @0910

DOE	Name	Current Location	Departure	Arrival
DOE Liaison	Deborah Wilber	Tokyo, Japan	UA 804 @1600	UA 0897 @1413
DOE Liaison	William Haley	Tokyo, Japan	UA 804 @1600	UA 0804 @1537

Others				
OFDA Director	Mark Bartollini	Tokyo, Japan	UA 0897 3/19@1322	UA 0897 3/20 @1635
Press Officer	Rebecca Gustafson	Tokyo, Japan	UA 0897 3/19@1322	UA 0897 3/20 @1635

March

NOTES	Total Days	Fri 11	Sat 12	Sun 13	Mon 14	Tue 15	Wed 16	Thur 17	Fri 18	Sat 19	Sun 20	Mon 21	Tue 22	Wed 23	Thur 24	Fri 25	Sat 26
	7			A	x	x	x	x	x	D							
	7			A	x	x	x	x	x	D							
	7			A	x	x	x	x	x	D							
	7			A	x	x	x	x	x	D							
ETD 3/30	20	A	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

NOTES		11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
ETD 3/19	4						A	x	x	D							
ETD 3/25	13			A	x	x	x	x	x	x	x	x	x	x	x	D	
ETD 3/25	10						A	x	x	x	x	x	x	x	x	D	
ETD 3/27	15			A	x	x	x	x	x	x	x	x	x	x	x	x	x
ETD 3/27	12						A	x	x	x	x	x	x	x	x	x	x
ETD 3/29	2																
ETD 3/29	2																
ETD 3/29	14						A	x	x	x	x	x	x	x	x	x	x

NOTES		11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
ETD 3/28	6													A	x	x	x
ETD 3/28	6													A	x	x	x

Narita	5										A	x	x	x	D		
Narita	5										A	x	x	x	D		

Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun
27	28	29	30	31	1	2	3	4	5	6	7	8	9	10
x	x	x	D											

27	28	29	30	31	1	2	3	4	5	6	7	8	9	10
D														
D														
	A	D												
	A	D												
x	x	D												

27	28	29	30	31	1	2	3	4	5	6	7	8	9	10
x	D													
x	D													

From: LIA07 Hoc
Sent: Thursday, March 31, 2011 9:37 AM
To: EOP
Cc: LIA01 Hoc; ET07 Hoc
Subject: Re: USNRC Earthquake/Tsunami Status Update March 31 0430 EDT

Steve:

This is regarding your question on the NRC March 31 0430 EDT Status Report. During the Deputies meeting yesterday (March 30), Chairman Jaczko discussed plant status based on his visit to Japan. He indicated that the Unit 4 spent fuel pool was full of water. This is different from our understanding of the spent fuel pool status. The status report was intended to convey the differences.

Please call the Headquarters Operations Officer at 301-816-5100 with questions.

Yen Chen
Executive Briefing Team Coordinator
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)

QQQ/203

From: Foggie, Kirk
Sent: Thursday, March 31, 2011 7:34 PM
To: LIA03 Hoc
Subject: Re: Notification of your arrival in the U.S.

Mugeh,

I'm back. But I think you know that. Enjoy your time in the Ops center.

Kirk
Sent from Blackberry.

From: LIA03 Hoc
To: Liaison Japan
Cc: LIA02 Hoc
Sent: Thu Mar 31 19:10:09 2011
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

2004

From: Emche, Danielle
Sent: Thursday, March 31, 2011 10:23 PM
To: LIA03 Hoc
Subject: Re: Notification of your arrival in the U.S.

Ok, I'll see what we can do. My current ticket is for 4/12 and Eric's is for 4/11. Bill Cook and Tony N. leave today. Dan Dorman leaves Sunday.
Danielle
Sent from an NRC BlackBerry.

From: LIA03 Hoc
To: Emche, Danielle
Sent: Thu Mar 31 21:43:07 2011
Subject: RE: Notification of your arrival in the U.S.

Don't have your and Eric's info. And we are missing return info on most travelers from Team#1.

Mugeh

From: Emche, Danielle
Sent: Thursday, March 31, 2011 8:50 PM
To: LIA03 Hoc
Subject: RE: Notification of your arrival in the U.S.

Mugeh, what do you have as my date?
Danielle

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

@@@|205

From: Emche, Danielle
Sent: Thursday, March 31, 2011 10:34 PM
To: LIA03 Hoc
Subject: Re: Notification of your arrival in the U.S.

Yes, I got another just after that with a different date. I'll check with my AID contact here.
Danielle
Sent from an NRC BlackBerry.

From: LIA03 Hoc
To: Emche, Danielle
Sent: Thu Mar 31 22:25:45 2011
Subject: RE: Notification of your arrival in the U.S.

Sorry Danielle - I just found an email from USAID dated 3/28th. You are showing as arriving in on April 9th. 3:37 p.m. at Dulles.

From: Emche, Danielle
Sent: Thursday, March 31, 2011 8:50 PM
To: LIA03 Hoc
Subject: RE: Notification of your arrival in the U.S.

Mugeh, what do you have as my date?
Danielle

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Stahl, Eric
Sent: Thursday, March 31, 2011 10:36 PM
To: LIA03 Hoc; Emche, Danielle
Cc: LIA02 Hoc
Subject: RE: Notification of your arrival in the U.S.
Attachments: Ticket reservations

It would probably be easiest/most accurate if you emailed those people individually about when they returned (dates have changed so many times, I'm not sure where the most accurate, up-to-date list can be found for people that are already back). Also, I have attached a list that just came in from USAID about return dates for NRC personnel that are currently here.

Foster, Ulses, Trapp and Devercelly have all been back for a few days. Brooke left yesterday (3/31)

Monninger is still here.

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 10:30 PM
To: Emche, Danielle; Stahl, Eric
Cc: LIA02 Hoc
Subject: RE: Notification of your arrival in the U.S.

Thanks. It is helpful as it doesn't match the U.S. AID list. Would be helpful to get confirmation on

Jim Trapp,
Tony Ulses
Jack Foster
John Moninger
Richard Devercelly
And Brooke left today?

We have flight information for most of Team#2, except for Dan Dorman, which you sent!

Thanks again.

From: Emche, Danielle
Sent: Thursday, March 31, 2011 10:23 PM
To: LIA03 Hoc
Subject: Re: Notification of your arrival in the U.S.

Ok, I'll see what we can do. My current ticket is for 4/12 and Eric's is for 4/11. Bill Cook and Tony N. leave today. Dan Dorman leaves Sunday.
Danielle
Sent from an NRC BlackBerry.

2007

From: LIA03 Hoc
To: Emche, Danielle
Sent: Thu Mar 31 21:43:07 2011
Subject: RE: Notification of your arrival in the U.S.

Don't have your and Eric's info. And we are missing return info on most travelers from Team#1.

Mugeh

From: Emche, Danielle
Sent: Thursday, March 31, 2011 8:50 PM
To: LIA03 Hoc
Subject: RE: Notification of your arrival in the U.S.

Mugeh, what do you have as my date?
Danielle

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: ET02 Hoc
Sent: Thursday, March 31, 2011 4:32 PM
To: ET07 Hoc
Subject: FW: RESPONSE - Commisioner TA Request for AMS Data

From: ET01 Hoc
Sent: Thursday, March 31, 2011 4:32:06 PM
To: ET02 Hoc
Subject: FW: RESPONSE - Commisioner TA Request for AMS Data
Auto forwarded by a Rule

From: Thaggard, Mark
Sent: Thursday, March 31, 2011 4:32:05 PM
To: ET01 Hoc
Subject: FW: RESPONSE - Commisioner TA Request for AMS Data
Auto forwarded by a Rule

As we discussed.

From: Giitter, Joseph
Sent: Thursday, March 31, 2011 3:04 PM
To: Sheron, Brian; Thaggard, Mark
Subject: FW: RESPONSE - Commisioner TA Request for AMS Data

From: Weber, Michael
Sent: Thursday, March 31, 2011 1:42 PM
To: Giitter, Joseph
Cc: Boger, Bruce; Zimmerman, Roy; ET05 Hoc; ET01 Hoc; OST02 HOC; FOIA Response.hoc Resource
Subject: RESPONSE - Commisioner TA Request for AMS Data

Sounds fine, Joe. We will need to caveat what we place on the Share Point site to emphasize that the information is OUO and is only released publicly by DOE. As an alternative, we could include a link to the DOE website where the AMS data are being routinely released by DOE (see http://blog.energy.gov/content/situation-japan) in our situation report or briefing sheet. Once decided, have the Liaison Team send a note to the Commissioner Assistants distribution list to advise on how to access this information.

Thanks

From: Giitter, Joseph
Sent: Thursday, March 31, 2011 11:22 AM
To: Weber, Michael

QQQ/208

Cc: Boger, Bruce
Subject: Commisioner TA Request for AMS Data

During our Commissioner TA briefing this morning we received a request for AMS data from the Fukushima Daiichi site. We propose to place this data on the Executive Briefing Background Book share point site (http://nsir-ops.nrc.gov) and provide the TAs with the link they need to access the site. We propose to continue to post information requested by the TAs on this site to ensure efficiency and consistency. Any thoughts on this and how we should communicate this approach to the TAs?

From: ET02 Hoc
Sent: Thursday, March 31, 2011 5:06 PM
To: Heard, Robert; Reyes, Debra; LIA02 Hoc; LIA03 Hoc
Cc: Turner, Joseph; Sullivan, Allen; Brusoe, Eric; Hincke, John; Bissett, Ryan; Padilla, William
Subject: RE: Op Center - Laptop

Bill Cook is returning from Japan – we need to switch his blackberry to Elmo Collins

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From: Heard, Robert
Sent: Thursday, March 31, 2011 4:11 PM
To: ET02 Hoc; Reyes, Debra; LIA02 Hoc; LIA03 Hoc
Cc: Turner, Joseph; Sullivan, Allen; Brusoe, Eric; Hincke, John; Bissett, Ryan; Padilla, William
Subject: RE: Op Center - Laptop

All:

I have updated the helpdesk ticket with the latest information from the operations center on this device swap.
"
According to the OIP staff here in the Ops Center, they are not sure if Todd Jackson has left Japan or is planning to leave. They have sent him an e-mail trying to confirm this so we shouldn't move blackberries until we receive confirmation on their status. We'll let you know when we know. Thanks...karen "

I have annotated in the ticket that the device should not be swapped until we get word from the ops center.

Rob

From: ET02 Hoc
Sent: Wednesday, March 30, 2011 9:40 PM
To: Reyes, Debra; LIA02 Hoc; LIA03 Hoc
Cc: Turner, Joseph; Sullivan, Allen; Brusoe, Eric; Heard, Robert; Hincke, John; Bissett, Ryan
Subject: RE: Op Center - Laptop

All,
William Cook will be leaving his BlackBerry with Elmo Collins. A ticket has been created for this transfer #509379. Elmo brought a Region IV laptop with him. I have recommended that Dan Dorman leave his laptop in Japan, just in case Elmo or another member of the team need it.
Cris Brown

From: Reyes, Debra
Sent: Tuesday, March 29, 2011 2:27 PM
To: ET02 Hoc; LIA02 Hoc; LIA03 Hoc
Cc: Turner, Joseph; Sullivan, Allen; Brusoe, Eric; Heard, Robert; Hincke, John; Bissett, Ryan; Reyes, Debra
Subject: Op Center - Laptop

Good afternoon,

000209

The attached list of OIS provided international laptops has been updated. The first five of the eleven on this list have not been configured with the generic encryption software password that is requested upon initial power on. The remaining six have been configured with the generic password, so that any user can login with the generic user id and password (instructions are attached). However, to login into Citrix you will need to login using your NRC user id and password (which authenticates users to the secure NRC network).

Please note that the generic login will not work on laptops provided by the Regions or Program Offices. All future international laptops issued by OIS will be configured with the generic login, so that the

Also attached are instructions for importing Citrix certificates and the mobile broadband card user guide:

(1) Japan Project Loaner Laptop Guide User Reference Guide
(2) How to Import MPKI (Citrix) Certificates for the Japan Project
(3) Verizon Mobile Broadband Card User Guide for the Japan Project

From: LIA07 Hoc
Sent: Thursday, March 31, 2011 4:45 AM
To: RST01 Hoc
Subject: FW: USNRC Earthquake/Tsunami Status Update

Follow Up Flag: Follow up
Flag Status: Flagged

RST,

Can you field this question?

Thanks,

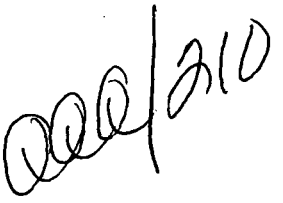
Jim

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Thursday, March 31, 2011 4:44 AM
To: LIA07 Hoc
Cc: LIA02 Hoc
Subject: USNRC Earthquake/Tsunami Status Update

I'm confused....the note below regarding Unit 4 SFP was contained in the 1800 EDT report, but it is missing/deleted from the 0430 report? Has this differing information about water levels now been resolved?

Note: *There is differing information on the current inventory of water in the Unit 4 SFP. While TEPCO is reporting level indication and some visual/thermography indication of a large current inventory, there is conflicting evidence indicating that the pool can only successfully retain much less inventory than normal. These contrary indicators include: steam that is emitted immediately when new water is added to the pool; physical damage to the structure that supports the pool; and the NRC's assessment of the post-earthquake timeline of events that led to the explosion in Unit 4. In summary, while there may be 3 to 6 days of inventory in the pool, there may also be much less inventory. TEPCO has successfully waited at least two days between additions of water.*

This email is UNCLASSIFIED.



March 31, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 65th Release)
(As of 15:00 March 31st, 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
  - In order to prepare to transfer the stagnant water on the basement floor of turbine building of Unit 1 to the Condenser, the water in the Condensate Storage Tank is being transferred to the Surge Tank of Suppression Pool Water. (From 12:00 March 31st)
  - Spray of fresh water over to the Spent Fuel Pool of Unit 1 using Concrete Pump Truck was carried out. (13:03 March 31st)
  - The transfer of the water in the Condensate Storage Tank of Unit 3 to the Surge Tank of Suppression Pool Water was completed. (From 17:40 March 28th till 08:37 March 31st)
  - The collected water in the vertical part of the trench outside of the turbine building of Unit 1 was transferred to the storage tank in the Main Building of Radioactive Waste Treatment Facilities by the temporary pump. Thereafter the water level from the top of the vertical part went down from approximately -0.14m to approximately -1.14m. (From 09:20 till 11:25 March 31st)

< Possibility on radiation exposure>

1. Exposure of residents

In Fukushima Prefecture, up until March 29th, the screening was done to 106,095 people. Among them, 102 people were at the level 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

As for the workers conducting operations in Fukushima Dai-ichi NPS, the total number of people who were at the level of exposure more than 100mSv becomes 20.

(Attached sheet)

1. The state of operation at NPS (Number of automatic shutdown units: 10)

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

(1) The state of operation

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 20th
Unit 6 (1,100MWe): in periodic inspection outage, cold shutdown at 19:27 March 20th

(2) Major Plant Parameters (As of 14:00 March 31st)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.430(A) 0.607(B)	0.090(A) 0.090(B)	0.117(A) 0.009(C)	—	0.108	0.104
CV Pressure (D/W) [kPa]	210	110	106.6	—	—	—
Reactor Water Level*2 [mm]	-1,600(A) -1,650(B)	-1,500(A) Not available(B)	-1,850(A) -2,250(B)	—	2,132	1,654
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	205	down scale (under survey)	175.5	—	—	—
Spent Fuel Pool Water Temperature [℃]	Indicator Failure	51.0	Indicator Failure	Indicator Failure	30.6	27.0
Time of Measurement	12:00 March 31st	12:00 March 31st	09:40 March 31st	March 31st	14:00 March 31st	14:00 March 31st

*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (10:17 March 12th)
- Seawater injection to the Reactor Pressure Vessel (RPV) via the Fire Extinguish Line started. (20:20 March 12th)
  →Temporary interruption of the injection (01:10 March 14th)
- The sound of explosion in Unit 1 occurred. (15:36 March 12th)
- The amount of injected water to the Reactor Core was increased by utilizing the Feedwater Line in addition to the Fire Extinguish Line. ($2m^3/h \rightarrow 18m^3/h$).(02:33 March 23rd) Later, it was switched to the Feedwater Line only (around $11m^3/h$). (09:00 March 23rd)
- Lighting in the Central Operation Room was recovered. (11:30 March 24th)
- As the result of concentration measurement in the stagnant water on the basement floor of the turbine building, $2.1 \times 10^5 Bq/cm^3$ of ^{131}I (Iodine) and $1.8 \times 10^6 Bq/cm^3$ of ^{137}Cs (Caesium) were detected as major radioactive nuclides.
- The pump for the fresh water injection to RPV of Unit 1 was switched from the Fire Pump Truck to the temporary motor-driven pump. (08:32 March 29th.)
- The Stagnant water on the basement floor of the turbine building was started to be transferred to the Condenser at around 17:00 March 24. As the Condenser was confirmed to be almost filled with water, pumping out of the water to the Condenser was stopped. (07:30 March 29th) In order to prepare to transfer the stagnant water on the basement floor of turbine building to the Condenser, the water in the Condensate Storage Tank is being transferred to the Surge Tank of Suppression Pool Water. (From 12:00 March 31st)
- Spray of fresh water over the Spent Fuel Pool of Unit 1 using Concrete Pump Truck was carried out. (13:03 March 31st)

- White smoke was confirmed to generate continuously. (As of 06:30 March 31st)
- Fresh water injection to RPV is being carried out. (As of 15:00 March 31st)

<Unit 2>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (11:00 March 13th)
- The Blow-out Panel of reactor building was opened due to the explosion in the reactor building of Unit 3. (After 11:00 March 14th)
- Reactor water level tended to decrease. (13:18 March 14th) TEPCO reported to NISA the event (Loss of reactor cooling functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14th)
- Seawater injection to RPV via the Fire Extinguish line was ready. (19:20 March 14th)
- Water level in RPV tended to decrease. (22:50 March 14th)
- Operation of Vent (0:02 March 15th)
- A sound of explosion was made in Unit 2. As the pressure in Suppression Pool (Suppression Chamber) decreased (06:10 March 15th), there was a possibility that an incident occurred in the Chamber. (About 06:20 March 15th)
- Electric power receiving at the emergency power source transformer from the external transmission line was completed. The work for laying the electric cable from the facility to the load side was carried out. (As of 13:30 March 19th)
- Injection of 40t of Seawater to the Spent Fuel Pool was started.(from 15:05 till 17:20 March 20th)
- Power Center of Unit 2 received electricity (15:46 March 20th)
- White smoke generated. (18:22 March 21st)
- White smoke was died down and almost invisible. (As of 07:11 March 22nd)

- Injection of 18t of Seawater to the Spent Fuel Pool was carried out. (From 16:07 till 17:01 March 22nd)
- White smoke was confirmed to generate continuously. (Around 06:20 March 25th)
- Injection of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 10:30 till 12:19 March 25th)
- White smoke was confirmed to generate continuously (As of 08:00 March 26th)
- Lighting of Central Operation Room was recovered (16:46 March26th)
- The pump for the fresh water injection to RPV of Unit 2 was switched from the Fire Pump Truck to the temporary motor-driven pump.(18:31 March 27th)
- Regarding the result of the concentration measurement in the stagnant water on the basement floor of the turbine building of Unit 2 of Fukushima Dai-ichi NPS announced by TEPCO on 27 March, TEPCO reported to NISA that as the result of analysis and evaluation through re-sampling, judging the measured value of Iodine-134 was wrong, the concentrations of gamma nuclides including Iodine-134 were less than the detection limit.(00:07 March 28)
- The Seawater injection to the Spent Fuel Pool using the Fire Pump Truck was switched to the fresh water injection using the temporary motor-driven pump. (From 16:30 till 18:25 March 29th)
- As the malfunction of the temporary motor-driven pump, which had been injecting to the Spent Fuel Pool of Unit 2 since 09:25 March 30th, was confirmed at 09:45 March 30th, the injection pump was switched to the Fire Pump Truck. However, because cracks were confirmed in the hose (12:47 and 13:10 March 30th), the injection was suspended. The injection of fresh water resumed at 19:05 March 30th. (Till 23:50 March 30th)
- In order to prepare to transfer the stagnant water on the basement floor of turbine building to the Condenser, the water in the Condensate Storage Tank is being transferred to the Surge Tank of Suppression Pool Water. (From 16:45 March 29th)
- White smoke was confirmed to generate continuously. (As of 06:30 March 31st)
- Fresh water injection to RPV is being carried out. (As of 15:00 March

31st)

<Unit 3>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (05:10 March 13th)
- Operation of Vent (20:41 March 12th)
- Operation of Vent (08:41 March 13th)
- Fresh water started to be injected to RPV via the Fire Extinguish Line. (11:55 March 13th)
- Seawater started to be injected to RPV via the Fire Extinguish Line. (13:12 March 13th)
- Seawater injection for Units 1 and 3 was interrupted due to the lack of seawater in pit. (01:10 March 14th)
- Seawater injection to RPV for Unit 3 was restarted. (03:20 March 14th)
- Operation of Vent (05:20 March 14th)
- The pressure in Primary Containment Vessel (PCV) of Unit 3 rose unusually. (07:44 March 14th) TEPCO reported to NISA on the event falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)
- In Unit 3, the explosion like Unit 1 occurred around the reactor building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the main control room of Units 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation of water injection. (11:30 March 16th)
- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)
- The Self-Defence Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)

- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground 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 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (Finished at 14:45 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department carried out the water spray. (Finished at 03:40 March 20th)
- The pressure in PCV of Unit 3 rose (320 kPa as of 11:00 March 20th). Preparation to lower the pressure was carried. Judging from the situation, immediate pressure relief was not required. Monitoring the pressure continues (120 kPa at 12:15 March 21st).
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 3 by Hyper Rescue Unit of Tokyo Fire Department was carried out (From 21:30 March 20th till 03:58 March 21st).
- Works for the recovery of external power supply is being carried out.
- Grayish smoke generated from Unit 3. (At around 15:55 March 21st)
- The smoke was confirmed to be died down. (17:55 March 21st)
- Grayish smoke changed to be whitish and seems to be ceasing. (As of 07:11 March 22nd)
- Water spray (Around 180t) by Hyper Rescue Unit of Tokyo Fire Department was carried out. (from 15:10 till 15:59 March 22nd)
- Lighting was recovered in the Central Operation Room. (22:43 March 22nd)
- Injection of 35t of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 11:03 till 13:20 March 23rd)
- Slightly blackish smoke generated from the reactor building. (Around 16:20 March 23rd) At around 23:30 March 23rd and around 4:50 March 24th, it was reported that the smoke seemed to cease.
- Around 120t of seawater was injected to the Spent Fuel Pool via the Fuel Pool Cooling Line. (From around 5:35 till around 16:05 March 24th)

- As the results of the survey of the stagnant water, into which workers who were laying electric cable on the ground floor and the basement floor of the turbine building of the Unit 3 walked, the dose rate on the water surface was around 400mSv/h, and as the result of gamma-ray analysis of the sampling water, the totaled concentration of each nuclide of the sampling water was around 3.9×10^{6} Bq/cm^{3}.
- Water spray by Kawasaki City Fire Bureau supported by Tokyo Fire Department was carried out. (From 13:28 till 16:00 March 25th)
- Water spray of approximately 100t using Concrete Pump Truck (50t/h) was carried out. (From 12:34 till 14:36 March 27th)
- The pump for the fresh water injection to RPV was switched from the Fire Pump Truck to the temporary motor-driven pump.(20:30 March 28th)
- Water spray (fresh water) of approximately 100t using Concrete Pump Truck (50t/h) was carried out. (From 14:17 till 18:18 March 29th)
- In order to prepare to transfer the stagnant water on the basement floor of turbine building to the Condenser, the water in the Condensate Storage Tank is being transferred to the Surge Tank of Suppression Pool Water. (From 17:40 March 28th to around 08:40 March 31st)
- White smoke was confirmed to generate continuously (As of 06:30 March 31st)
- Injection of fresh water to RPV is being carried out. (As of 15:00 March 31st)

<Unit 4>

- Because of the replacement work of the Shroud of RPV, no fuel was inside the RPV.
- The temperature of water in the Spent Fuel Pool had increased. (84 ℃ at 04:08 March 14th)
- It was confirmed that a part of wall in the operation area of Unit 4 was damaged. (06:14 March 15th)
- The fire at Unit 4 occurred. (09:38 March 15th) TEPCO reported that the fire was extinguished spontaneously. (11:00 March 15th)
- The fire occurred at Unit 4. (5:45 March 16th) TEPCO reported that no fire could be confirmed on the ground.(At around 06:15 March 16th)
- The Self-Defence Force started water spray over the Spent Fuel Pool of

Unit 4 (09:43 March 20th).

- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 4 by Self-Defense Force was started. (From around 18:30 till 19:46 March 20th).
- Water spray over the Spent Fuel Pool by Self-Defence Force using 13 fire engines was started (From 06:37 till 08:41 March 21st).
- Works for laying electricity cable to the Power Center was completed. (At around 15:00 March 21st)
- Power Center received electricity. (10:35 March 22nd)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (from 17:17 till 20:32 March 22nd)
- Spray of around 130t of water using Concrete Pump Truck (50t/h) was carried out. (From 10:00 till 13:02 March 23rd)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (From 14:36 till 17:30 March 24th)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (From 19:05 till 22:07 March 25th)
- Injection of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 06:05 till 10:20 March 25th)
- Water spray of approximately 125t using Concrete Pump Truck (50t/h) was carried out. (From 16:55 till 19:25 March 28th)
- Lighting of Central Operation Room was recovered. (11:50 March 29th)
- White smoke was confirmed to generate continuously. (As of 06:30 March 29th)
- Spray of fresh water (Around 140t) over the Spent Fuel Pool using Concrete Pump Truck (50t/h) was carried out. (From 14:04 till 18:33 March 30th)

<Units 5 and 6>

- The first unit of Emergency Diesel Generator (B) for Unit 6 is operating and supplying electricity. Water injection to RPV and the Spent Fuel Pool through the system of Make up Water Condensate (MUWC) is being carried out.
- The second unit of Emergency Diesel Generator (A) for Unit 6 started up. (04:22 March 19th)

- The pumps for Residual Heat Removal (RHR) (C) for Unit 5 (05:00 March 19th) and RHR (B) for Unit 6 (22:14 March 19th) started up and recovered heat removal function. It cools Spent Fuel Pool with priority. (Power supply : Emergency Diesel Generator for Unit 6) (05:00 March 19th)
- Unit 5 under cold shut down (14:30 March 20th)
- Unit 6 under cold shut down (19:27 March 20th)
- Receiving electricity reached to the transformer of starter. (19:52 March 20th)
- Power supply to Unit 5 was switched from the Emergency Diesel Generator to external power supply. (11:36 March 21st)
- Power supply to Unit 6 was switched from the Emergency Diesel Generator to external power supply. (19:17 March 22nd)
- The temporary pump for RHR Seawater System (RHRS) of Unit 5 was automatically stopped when the power supply was switched from the temporary to the permanent. (17:24 March 23rd)
- Repair of the temporary pump for RHRS of Unit 5 was completed (16:14 March 24th) and cooling was started again. (16:35 March 24th)
- Power supply for the temporary pump for RHRS of Unit 6 was switched from the temporary to the permanent. (15:38 and 15:42 March 25th)

<Common Spent Fuel Pool>

- It was confirmed that the water level of Spent Fuel Pool was maintained almost full at after 06:00 March 18th.
- Water spray over the Common Spent Fuel Pool was started (From 10:37 till 15:30 March 21st)
- The power was started to be supplied (15:37 March 24th) and cooling was also started.(18:05 March 24th)
- As of 08:20 March 30th, water temperature of the pool was around 32℃.

<Other>

- As the result of nuclide analysis at around the Southern Water Discharge Canal, 7.4×10^{1}Bq/cm^3 of ^{131}I (Iodine) (1,850.5 times higher than the concentration limit in water outside the Environmental Monitoring Area) was detected. (14:30 March 26th)

(As the result of measurement on 29 March, it was detected as 3,355.0 times higher than the limit in water (13:55 March 29th). On the other hand, as the result of the analysis at the north side of the Water Discharge Canal of the NPS, 4.6×10^1Bq/cm^3 of ^{131}I (Iodine) (1,262.5 times higher than the limit in water) was detected. (14:10 March 29th)

- The water was confirmed to be collected in the vertical parts of the trenches (an underground structure for laying pipes, shaped like a tunnel) outside of the turbine building of Units 1 to 3. The dose rates on the water surface were 0.4 mSv/h of the Unit 1's trench and 1,000 mSv/h of the Unit 2's trench. The rate of the Unit 3's trench could not measure because of the rubble. (Around 15:30 March 27th) The collected water in the vertical part of the trench outside of the turbine building of Unit 1 was transferred to the storage tank in the Main Building of Radioactive Waste Treatment Facilities by the temporary pump. Thereafter the water level from the top of the vertical part went down from approximately -0.14m to approximately -1.14m. (From 09:20 till 11:25 March 31st)
- In the samples of soil collected on 21 and 22 March 2011 on the site (at 5 points) of Fukushima Dai-ichi NPS, plutonium 238, 239 and 240 were detected (23:45 March 28th announced by TEPCO). The concentration of the detected plutonium was at the equivalent level of the fallout (radioactive fallout) that was observed in Japan concerning the past atmospheric nuclear testing, i.e. at the equivalent level of the normal condition of environment, and was not at the level of having harmful influence on human body.
- When removing the flange of pipes of Residual Heat Removal Seawater System outside the building of Unit 3, three subcontractor's employees were wetted by the water remaining in the pipe. However, as the result of wiping the water off, no radioactive materials were attached to their bodies. (12:03 March 29th)
- On March 28th, the stagnant water was confirmed in the Main Building of Radioactive Waste Treatment Facilities. As the result of analysis of radioactivity, the total amount of the radioactivity 1.2×10^1 Bq/cm^3 in the controlled area and that of 2.2×10^1 Bq/cm^3 in the non-controlled area were detected in March 29th.

● Fukushima Dai-ni NPS (TEPCO)

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

(1) The state of operation

Unit1 (1,100MWe): automatic shutdown, cold shut down at 17:00, March 14th

Unit2 (1,100MWe): automatic shutdown, cold shut down at 18:00, March 14th

Unit3 (1,100MWe): automatic shutdown, cold shut down at 12:15, March 12th

Unit4 (1,100MWe): automatic shutdown, cold shut down at 07:15, March 15th

(2) Major plant parameters (As of 12:00 March 31st)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.14	0.10	0.14
Reactor water temperature	℃	27.4	27.0	34.3	26.9
Reactor water level*2	mm	9,296	10,246	7,824	7,854
Suppression pool water temperature	℃	24	26	27	28
Suppression pool pressure	kPa (abs)	106	106	103	103
Remarks		cold shutdown	cold shutdown	cold shutdown	cold shutdown

*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 30th, 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 stopped to generate. 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 Residual Heat Removal System (B) to cool the reactor of Unit 1 became to be able to receive power from the emergency power supply as well as the external power supply. This resulted in securing the backup power supplies (emergency power supplies) of Residual Heat Removal System (B) for all Units. (14:30 March 30th)

(4) Report concerning other incidents

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

● Onagawa NPS (Tohoku Electric Power Co. Inc.)
(Onagawa Town, Oga County and Ishinomaki City, Miyagi Prefecture)

(1) The state of operation

Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12th
Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake
Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12th

(2) Readings of monitoring post, etc.

MP2 (Monitoring at the North End of Site Boundary)
approx. 0.62 μ SV/h (16:00 March 29th) → approx. 0.58 μ SV/h (16:00 March 30th)

(3) Report concerning other incidents

- Fire Smoke on the first basement of the Turbine Building was confirmed to be extinguished. (22:55 on March 11th)
- Tohoku Electric Power Co. reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:09 March 13th)

2. Action taken by NISA

(March 11th)

14:46 Set up of the NISA Emergency Preparedness Headquarters (Tokyo) immediately after the earthquake

15:42 TEPCO reported to NISA in accordance with the 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) in accordance with the 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-ni NPS, TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

18:33 Regarding Units 1, 2 and 4 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the 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 a direction for the residents within 2 km radius from Unit 1 of Fukushima Dai-ichi NPS to evacuate. (The population of this area is

1,864.)

21:23 Directives 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 occurred at Fukushima Dai-ichi NPS, TEPCO, in accordance with the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

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

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

(March12th)

0:49 Regarding Units 1 TEPCO Fukushima Dai-ichi NPS, TEPCO recognized the event (Unusual rise of the pressure in PCV) in accordance with the 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-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the 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-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

05:44 Residents within 10km radius from Unit 1 of Fukushima Dai-ichi NPS shall evacuate by the Prime Minister Directive.

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

06:50 In accordance with the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to control the internal pressure

of PCV of Units 1 and 2 of Fukushima Dai-ichi NPS.

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

- Direction for the residents within 3km radius from Fukushima Dai-ni NPS to evacuate
- Direction for the residents within 10km radius from Fukushima Dai-ni NPS to stay in-house

17:00 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

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

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

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

20:05 Considering the Directives from the Prime Minister and pursuant to the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to inject seawater to Unit 1 of Fukushima Dai-ichi NPS and so on.

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

(March 13th)

05:38 TEPCO reported to NISA the event (Total loss of coolant injection function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 3 of Fukushima Dai-ichi NPS. Recovering efforts by TEPCO of the power source and coolant injection function and the work on venting were under way.

09:01 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the 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 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 Directive was issued for the Governor of Fukushima Prefecture, the Mayors of Okuma Town, Futaba Town, Tomioka Town and Namie Town in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness on the contents of radioactivity decontamination screening.

13:09 Tohoku Electric Power Co. reported to NISA that Onagawa NPS reached a situation specified in the 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 14th)

01:10 Seawater injection for Units 1 and 3 of Fukushima Dai-ichi NPS were temporarily interrupted due to the lack of seawater in pit.

03:20 Seawater injection for Unit 3 of Fukushima Dai-ichi NPS was restarted.

04:40 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the 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 the 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 PCV) falling under the 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) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

22:13 TEPCO reported to NISA in accordance with the 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 15th)

00:00: The acceptance of experts from IAEA was decided. NISA agreed to accept the offer of dispatching of the expert on NPS damage 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 the acceptance of experts dispatched from NRC.

07:21 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

07:24 Incorporated Administration Agency, Japan Atomic Energy Agency (JAEA) reported to NISA in accordance with the 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 in accordance with the 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness

regarding Fukushima Dai-ichi NPS.

10:30 According to the Nuclear Regulation Act, the Minister of Economy, Trade and Industry issued the directions as follows.

For Unit 4: To extinguish fire and to prevent the occurrence of re-criticality

For Unit 2: To inject water to reactor vessel promptly and to vent Drywell.

10:59 Considering the possibility of lingering situation, it was decided that the function of the Local Nuclear Emergency Response Headquarters was moved to the Fukushima Prefectural Office.

11:00 The Prime Minister directed the in-house stay area.

In-house stay was additionally directed to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS considering in-reactor situation.

16:30 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

22:00 According to the Nuclear Regulation Act, the Minister of Economy, Trade and Industry issued the following direction.

For Unit 4: To implement the injection of water to the Spent Fuel Pool.

23:46 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 18th)

13:00 Ministry of Education, Culture, Sports, Science and Technology decided to reinforce the nation-wide monitoring survey in the emergency of Fukushima Dai-ichi and Dai-ni NPS.

15:55 TEPCO reported to NISA on the accidents and failure 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 area of radiation) pursuant to the 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) pursuant to the Article 62-3 of the Nuclear Regulation Act.

(March 19th)

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

TEPCO reported to NISA that the pump for RHR (C) for Unit 5 started up and started to cooling 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 20th)

23:30 Directive from Local Nuclear Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village) was issued regarding the change of the reference value for the screening level for decontamination of radioactivity.

(March 21st)

07:45 Directive titled as "Administration of the stable Iodine" was issued from Local Nuclear Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs 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 on personal judgements.

16:45 Directive titled as "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 and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs 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 Directive from the Director-general of the Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi and Gunma was issued, which direct 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 22nd)

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

(March 25th)

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

(March 28th)

Regarding the mistake in the evaluation of the concentration measurement in the stagnant water on the basement floor of the turbine building of Unit 2 of Fukushima Dai-ichi NPS 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 (Stagnant 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 accomplish the communication in the company on significant information in a timely manner and to report it in a timely and appropriate manner.

(March 29th)

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 the Article 62-3 of the Nuclear Regulation Act and the 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 "Team to Assist the Lives of the Nuclear Accident Sufferers" 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.

(March 30th)

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

< Possibility on radiation exposure (As of 15:00 March 31st) >

1. Exposure of residents

(1) Including the 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 13,000 cpm 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
18,000cpm	1
30,000-36,000cpm	1
40,000cpm	1
little less than 40,000cpm*	1
very small counts	5

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

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

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

(5) The 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 13 March. It is carried out by rotating the evacuation sites and at the 13 places (set up permanently) such as health offices. Up until March 29th, the screening was done to 106,095 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

As for the workers conducting operations in Fukushima Dai-ichi NPS, the total number of people who were at the level of exposure more than 100mSv becomes 20.

For two out of the three workers who were confirmed to be at the level of exposure 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 25th, 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 3 Sv. 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.

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 17th. 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 24th, 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 at not at the level of having harmful influence.
(4) From March 26th to 27th, examinations of thyroid gland for 137 children aged from 1 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.

<Directive of screening levels for decontamination of radioactivity>
(1) On March 20th, the Local Nuclear Emergency Response Headquarters issued the directive to change the reference value for the screening level for decontamination of radioactivity as the following to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village).

Old : 40 Bq/cm^2 measured by a gamma-ray survey meter or 6,000 cpm
New : 1 μ Sv/hour (dose rate at 10cm distance) or 100,000cpm equivalent

<Directives of administrating stable Iodine during evacuation>
(1) On March 16th, the Local Nuclear Emergency Response Headquarters issued "Directive to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village).
(2) On March 21st, the Local Nuclear Emergency Response Headquarters issued Directive titled as "Administration of the stable Iodine" to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs the above-mentioned governor and heads to administer stable Iodine under the direction of the

headquarters and in the presence of medical experts, and not to administer it on personal judgements.

<Situation of the injured (As of 15:00 March 31st)>

1. Injury due to earthquake on 11 March
   - Two employees (slightly, have already gone back working)
   - Two subcontract employees (one fracture in both legs, be in hospital)
   - Two missing (TEPCO's employee, missing in the turbine building of Unit 4)

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 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 return to work.)
   - Three subcontractor employees (They have already return 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 17th.)

4. Other injuries
   - Tow 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 22 and 23 March. (One employee has already returned to work and the other is under home treatment.)
   - One emergency patient on 12 March. (cerebral infarction, 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)
- 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 13 March. (One employee has already returned to work and the other is under home treatment.)

<Situation of resident evacuation (As of 08:30 March 31st)>

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

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

- The in-house stay in the area from 20 km to 30 km 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 are implemented.
- On March 28th, Chief Cabinet Secretary mentioned the continuation of the limited-access within the area of 20 km 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 20 km zone.

<Directives regarding foods and drinks>

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

(1) Items under the suspension of shipment and restriction of intake (As of March 29th)

Prefectures	Suspension of shipment	Restriction of intake
Fukushima Prefecture	Non-head type leafy vegetables, head type leafy vegetables , flowerhead brassicas (Spinach, Cabbage, Broccoli, Cauliflower, *Komatsuna**, *Kukitachina**, *Shinobufuyuna**, Rape, *Chijirena, Santouna*, Kousaitai*, Kakina*, etc.*), Turnip, Raw milk	Non-head type leafy vegetables, head type leafy vegetables , flowerhead brassicas (Spinach, Cabbage, Broccoli, Cauliflower, *Komatsuna**, *Kukitachina**, *Shinobufuyuna,* Rape, *Chijirena, Santouna*, Kousaitai*, Kakina*, etc.*)
Ibaraki Pref.	Spinach, *Kakina**, Parsley, Raw milk	
Tochigi Pref.	Spinach, *Kakina**	
Gunma Pref.	Spinach, *Kakina**	

*a green vegetable

(2) Request for restriction of drinking for tap-water (As of March 30th)

Scope under restriction	Water service (Local governments requested for restriction)
All residents	Iitate small water service (Iitate Village, Fukushima Prefecture)
Babies ・Water services that continue to respond to the directive	<Fukushima Prefecture> Iwaki City water supply service (Iwaki City) Date City Tuskidate small water supply service (Date City)
・Tap-water supply service that continues	Non

to respond to the directive	

<Directive regarding the ventilation when using heating equipments in the aria of indoor evacuation >

On March 21st, Directive titled as "Ventilation for using heating equipments within the in-house evacuation zone" from the Director-General of Local Nuclear Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village) was issued, which directs those 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.

< Fire Bureaus' Activities>

- From 11:00 till around 14:00 on March 22nd, 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 23rd, Niigata City Fire Bureau and Hamamatsu City Fire Bureau gave guidance to TEPCO as to the operation of large decontamination system.

(Contact Person)
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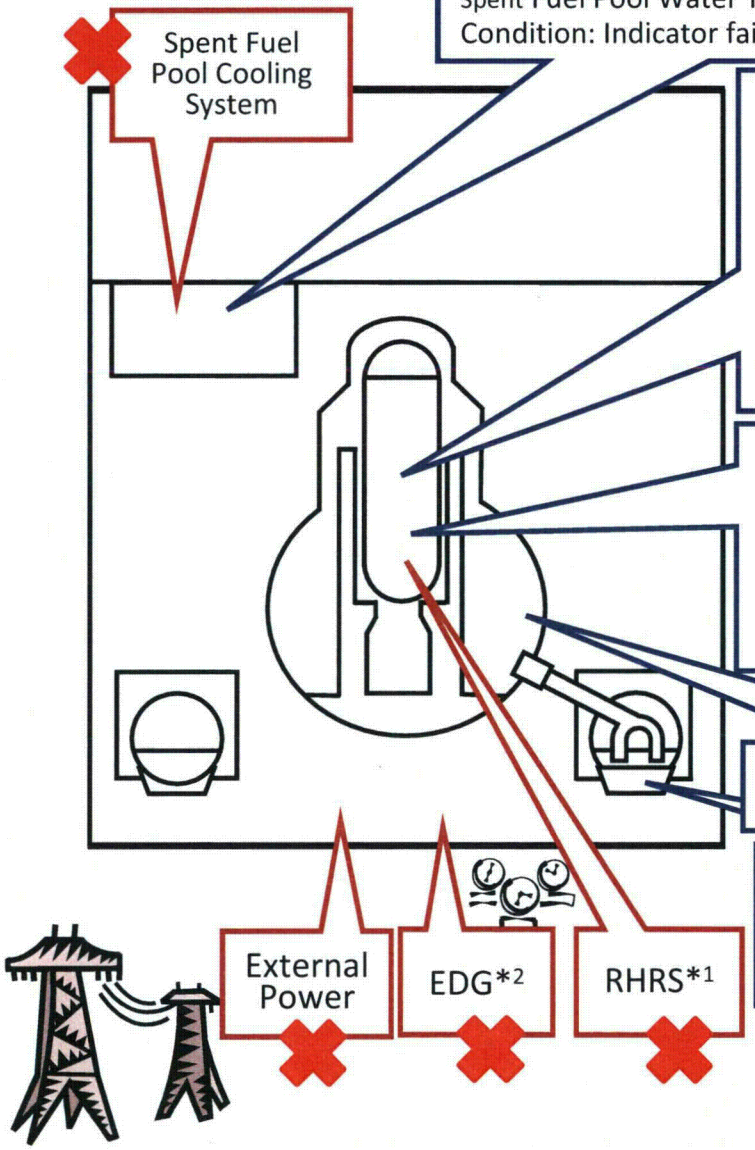
Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1
(As of 14:00 March 31th, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition: Indicator failure

Reactor Pressure A 0.430MPa*
Reactor Pressure B 0.607MPa*
Condition : No large fluctuation
*converted to absolute pressure
Reactor Water Level A —1,600mm
Reactor Water Level B —1,650mm
Condition: No flooding of top of active fuel until the above level

Reactor Water Temperature — ℃
Condition: No data available

Reactor Pressure Vessel (RPV) Temperature:
Feedwater Nozzle Temperature :246.1℃
Temperature at the bottom head of RPV :126.1℃

PCV*3 Pressure 0.210MPa
Condition: No large fluctuation

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure 0.205MPa
Condition : No large fluctuation

Major Events after the earthquake

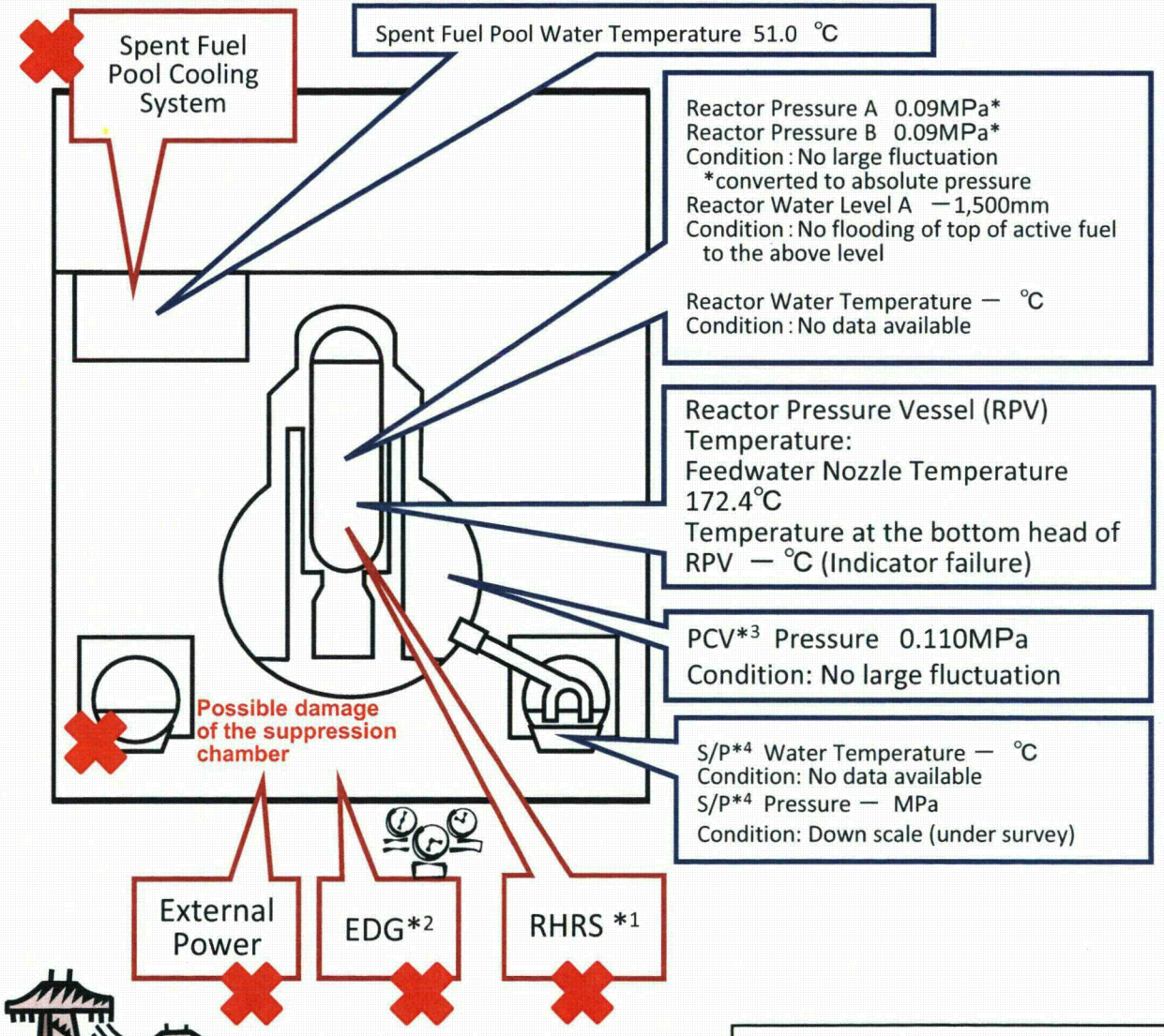
- 11th 14:46 Under operation, Automatic shutdown by the earthquake
- 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 12th 01:20 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
- 12th 10:17 Started to vent.
- 12th 15:36 Sound of explosion
- 12th 20:20 Started to inject seawater and borated water to core.
- 23rd 02:33 The amount of injected water to the Rector Core was increased utilizing the Feedwater Line in addition to the Fire Extinguish Line. ($2m^3/h \rightarrow 18m^3/h$)
- 23rd 09:00 Switched to the Feedwater Line only.($18m^3/h \rightarrow 11m^3/h$)
- 24th 11:30 Lighting in the Central Control Room was recovered.
- 25th 15:37 Started fresh water injection.
- 29th 08:32 Switched to the water injection to the core using the temporary motor-driven pump.
- 31st 13:03 Fresh water spray by Concrete Pump Truck (Fresh water)

*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Primary Containment Vessel
*4 Suppression Pool

Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the core

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2
(As of 14:00 March 31th, 2011)



*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Primary Containment Vessel
*4 Suppression Pool

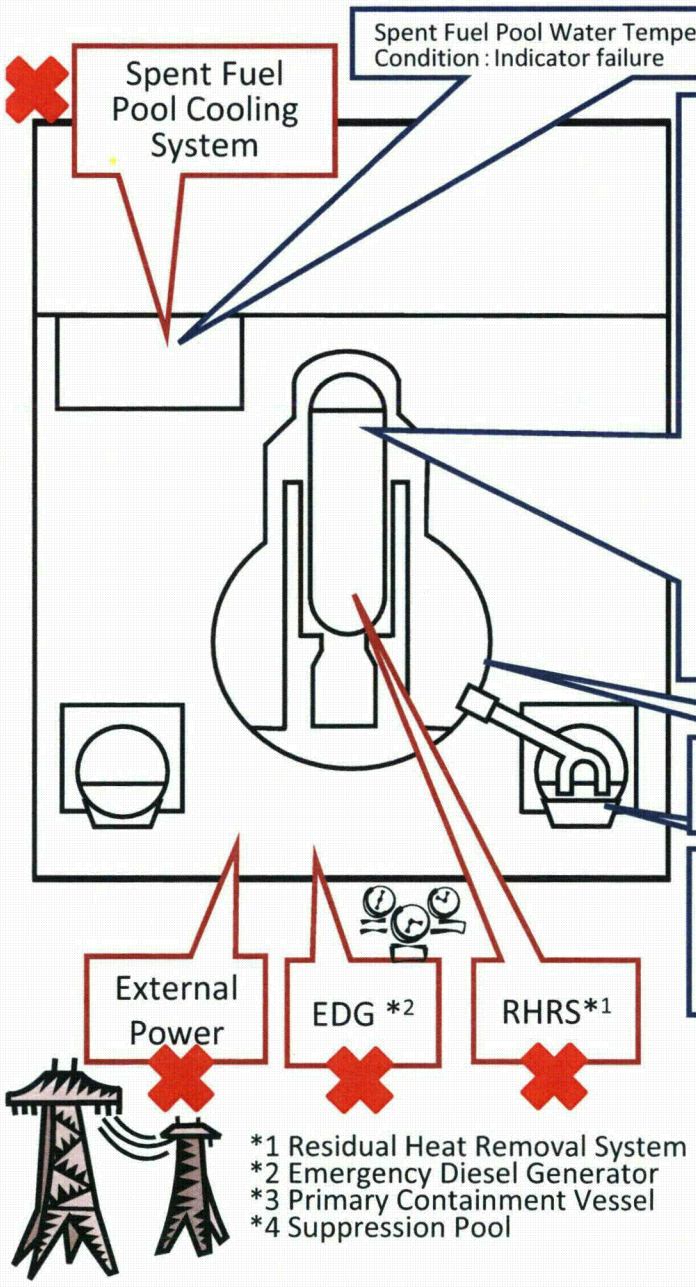
Major Events after the earthquake

- 11th 14:46 Under operation, Automatic shutdown by the earthquake
- 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 13th 11:00 Started to vent.
- 14th 13:25 Occurrence of the Article 15 event (Loss of reactor cooling functions)
- 14th 16:34 Started to inject water to the Reactor Core.
- 14th 22:50 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
- 15th 00:02 Started to vent.
- 15th 06:10 Sound of explosion
- 15th around 06:20 Possible damage of the suppression chamber
- 20th 15:05～17:20 Approximately 40 ton seawater injection to the Spent Fuel Pool (SFP) via the Fuel Pool Cooling Line (FPC)
- 20th 15:46 Power Center received electricity.
- 21st 18:22 White smoke generated. The smoke died down and almost invisible at 07:11 March 22nd.
- 22nd 16:07 Injection of around 18 tons of seawater to SFP
- 25th 10:30～12:19 Sea water injection to SFP via FPC
- 26th 10:10 Started to inject fresh water to the Reactor Core.
- 26th 16:46 Lighting in the Central Control Room was recovered.
- 27th 18:31 Switched to the water injection to the core using the temporary motor-driven pump.
- 29th 16:30～18:25 Switched to the temporary motor-driven pump injecting fresh water to SFP.
- 30th 9:25～23:50 Confirmed malfunction of the temporary motor-driven pump injecting fresh water to SFP(9:45). Switched to the injection using the fire pump Truck, but suspended as cracks were confirmed in the hose. (12:47, 13:10) Resumed injection of fresh water(19:05)

Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the core

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3
(As of 14:00 March 31th, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition : Indicator failure

Reactor Pressure A 0.117MPa*
Reactor Pressure C 0.009MPa*
Condition : No large fluctuation
*converted to absolute pressure
Reactor Water Level A −1,850mm
Reactor Water Level B −2,250mm
Condition : No flooding of top of active fuel to the above level

Reactor Water Temperature —℃
Condition : No data available

Reactor Pressure Vessel (RPV) Temperature
Feedwater Nozzle Temperature
: 88.6℃(under survey)
Temperature at the bottom head of RPV : 114.4℃

PCV*3 Pressure 0.1066MPa
Condition: No large fluctuation

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure 0.1755MPa
Condition: No large fluctuation

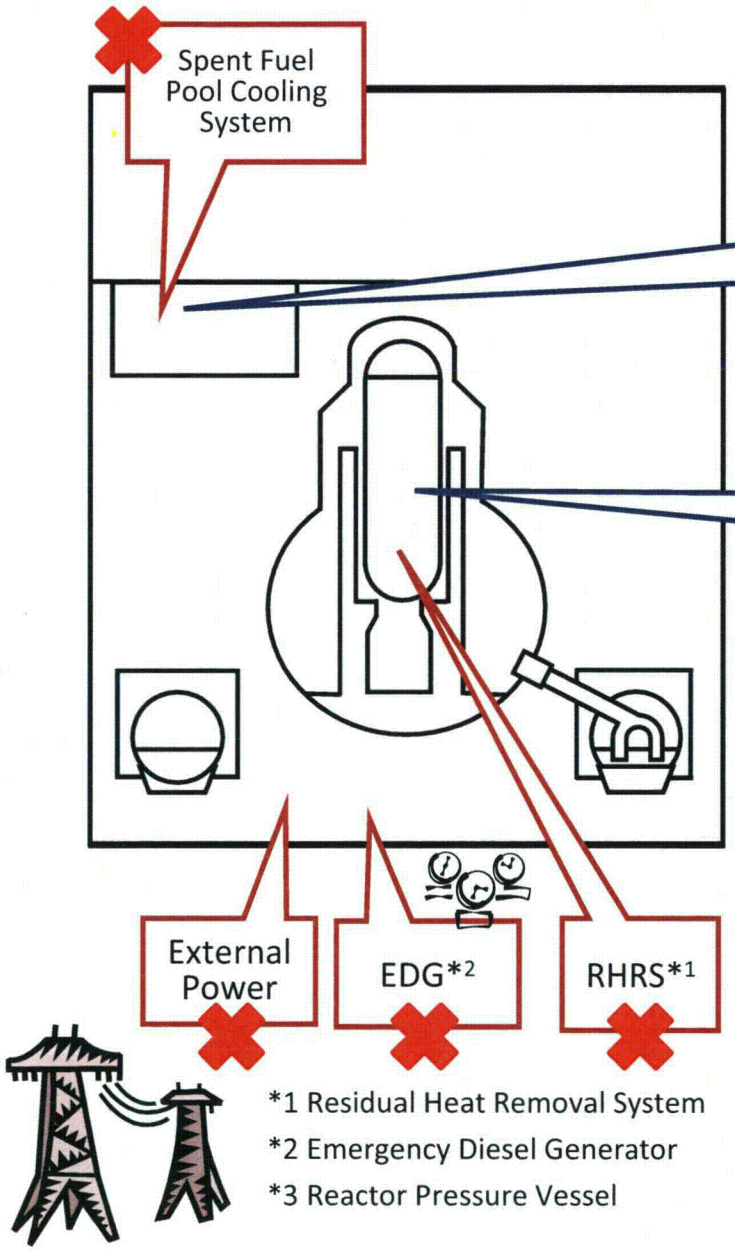
Major Events after the earthquake

11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 15:42 Report based on the Article 10 (Total loss of A/C power)
13th 05:10 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
13th 08:41 Started to vent.
13th 13:12 Started to inject seawater and borated water to core.
14th 05:20 Started to vent.
14th 07:44 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
14th 11:01 Sound of explosion
16th around 08:30 White smoke generated.
17th 09:48～10:01 Water discharge by the helicopters of Self-Defense Force
17th 19:05～19:15 Water spray from the ground by High pressure water-cannon trucks of Police
17th 19:35～20:09 Water spray from the ground by fire engines of Self-Defense Force
18th before 14:00～14:38 Water spray from the ground by 6 fire engines of Self-Defense Force
18th ～14:45 Water spray from the ground by a fire engine of the US Military
19th 00:30 ～01:10 Water spray by Hyper Rescue Unit of Tokyo Fire Department
19th 14:10 ～ 20th 03:40 Water spray by Hyper Rescue Unit of Tokyo Fire Department
20th 11:00 Pressure of PCV rose(320kPa).Afterward fell.
20th 21:36 ～ 21st 03:58 Water spray by Hyper Rescue Unit of Tokyo Fire Department
21st about 15:55 Grayish smoke generated and was confirmed to be died down at 17:55.
22nd 15:10 ～16:00 Water spray by Hyper Rescue Unit of Tokyo Fire Department and Osaka City Fire Bureau.
22nd 22:46 Lighting in the Central Control Room was recovered.
23rd 11:03 ～13:20 Injection of about 35ton of sea water to the Spent Fuel Pool (SFP) via the Fuel Pool Cooling Line (FPC)
23rd around 16:20 Black smoke generated and was confirmed to died down at around 23:30 and 24th 04:50.
24th 05:35～16:05 Approximately 120 ton sea water injection to SFP via FPC
25th 13:28～16:00 Water spray by Kawasaki City Fire Bureau supported by Tokyo Fire Department
25th 18:02 Started fresh water injection to the core.
27th 12:34～14:36 Water spray by Concrete Pump Truck
28th 20:30 Switched to the water injection to the core using a temporary motor-driven pump.
29th 14:17 ～18:18 Fresh water spray by Concrete Pump Truck

Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the core

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
(As of 14:00 March 31th, 2011)



In periodic inspection outage

Spent Fuel Pool Water Temperature — ℃
Condition: Indicator failure

No fuel is inside the reactor core

*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Reactor Pressure Vessel

Major events after the earthquake

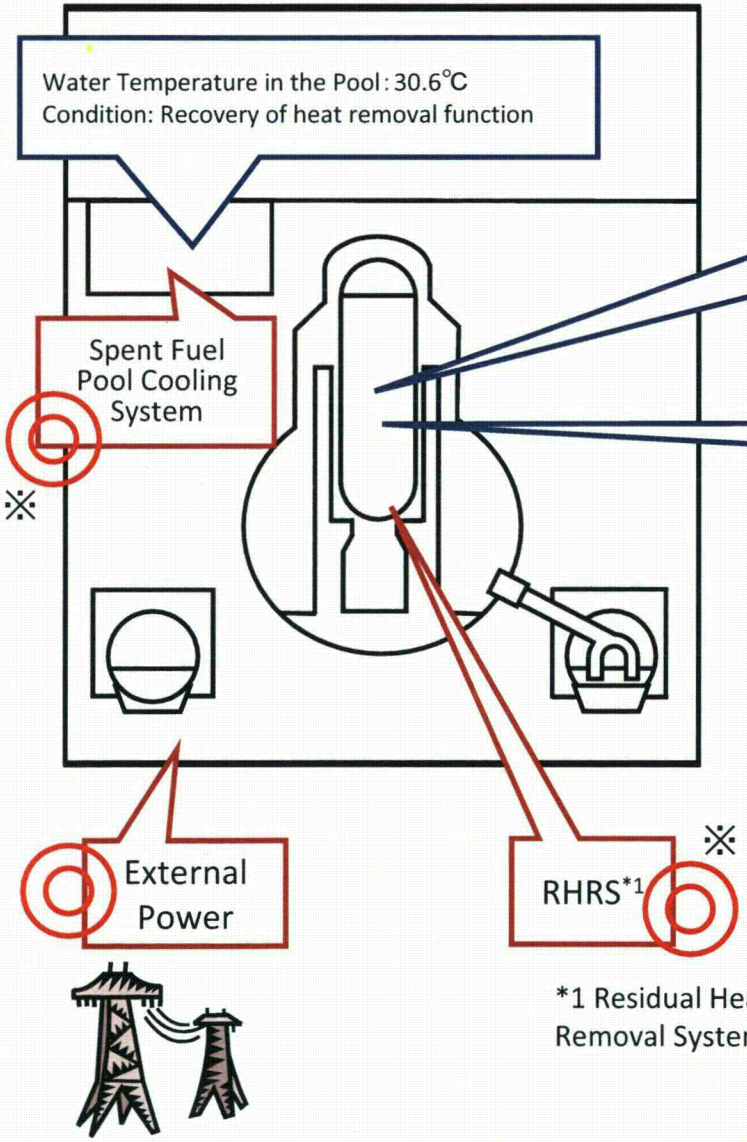
In periodic inspection outage when the earthquake occurred
14th 04:08 Water temperature in the Spent Fuel Pool (SFP), 84℃
15th 06:14 Confirmed the partial damage of wall in the 4th floor.
15th 09:38 Fire occurred in the 3rd floor. (12:25 extinguished)
16th 05:45 Fire occurred. TEPCO couldn't confirm any fire on the ground. (06:15)
20th 08:21～09:40 Water spray over SFP by Self-Defense Force
20th around 18:30～19:46 Water spray over SFP by Self-Defense Force
21st 06:37～08:41 Water spray over SFP by Self-Defense Force
21st about 15:00 Work for laying cable to Power Center was completed.
22nd 10:35 Power Center received electricity.
22nd 17:17～20:32 Water spray by Concrete Pump Truck
23rd 10:00～13:02 Water spray by Concrete Pump Truck
24th 14:36～17:30 Water spray by Concrete Pump Truck
25th 06:05～10:20 Sea water injection to SFP via the Fuel Pool Cooling Line (FPC)
25th 19:05～22:07 Water spray by Concrete Pump Truck
27th 16:55～19:25 Water spray by Concrete Pump Truck
29th 11:50 Lighting in the Central Control Room was recovered.
30th 14:04～18:33 Water spray by Concrete Pump Truck (Fresh water)

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

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5
(As of 14:00 March 31th, 2011)

In periodic inspection outage



Reactor Pressure : 0.108MPa*
Reactor Water Level : 2,132mm
Reactor Water Temperature : 47.4℃
Condition : Pressure is under control.
*converted to absolute pressure

Reactor Pressure Vessel Temperature:
Monitoring by Reactor Water Temperature

※Heat removal was carried out alternately with the water in the Reactor Core and in the Spent Fuel Pool.

*1 Residual Heat Removal System

Current Conditions:

20th 14:30 Cold shutdown

21st 11:36 Receiving electricity from external power supply

23rd 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.

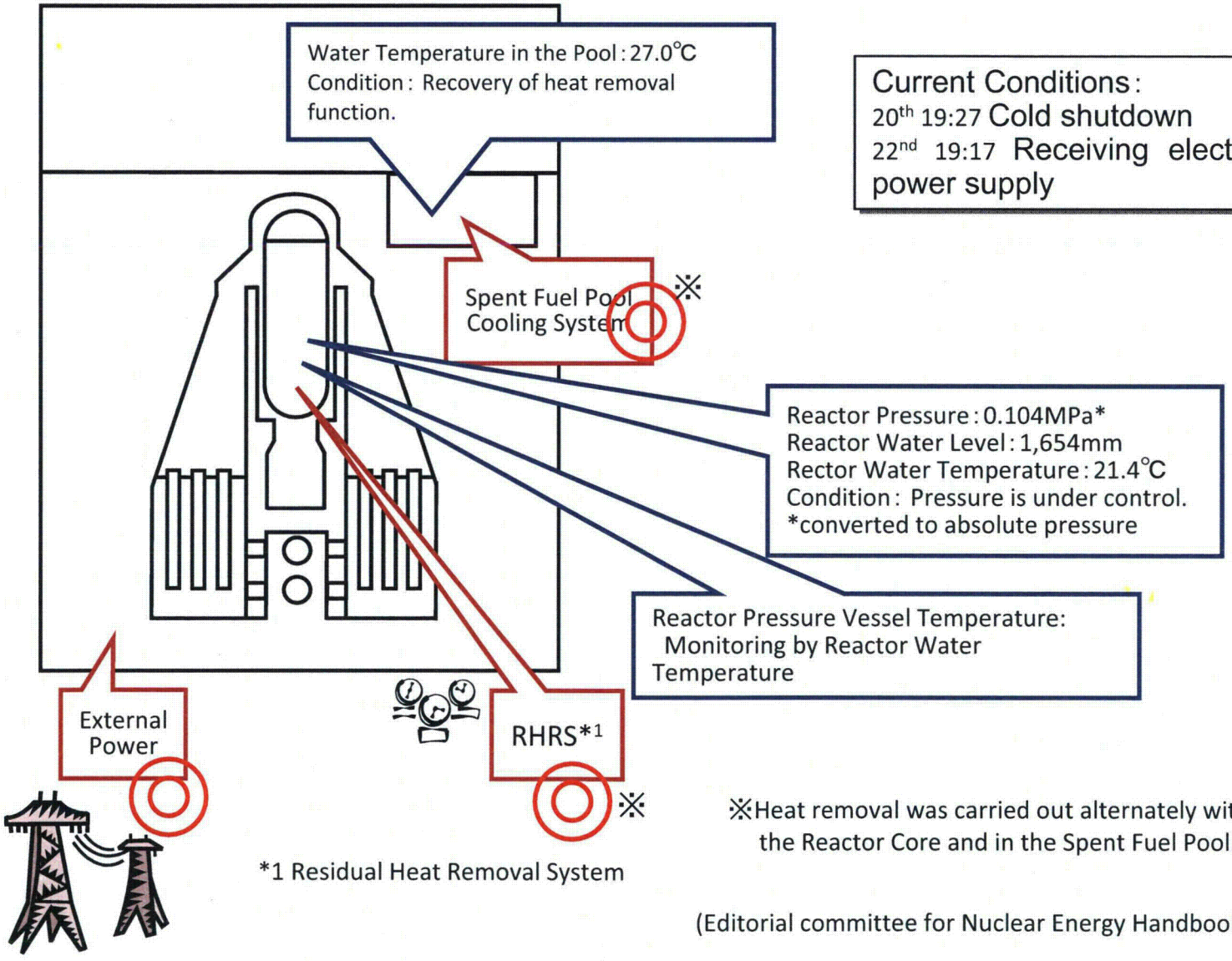
24th 16:14 Repair of the RHRS pump was completed.

24th 16:35 Started to cooling.

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 14:00 March 31th, 2011)

In periodic inspection outage



Current Conditions :
20th 19:27 Cold shutdown
22nd 19:17 Receiving electricity from external power supply

*1 Residual Heat Removal System

※Heat removal was carried out alternately with the water in the Reactor Core and in the Spent Fuel Pool.

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

福島第一原子力発電所　プラント関連パラメータ

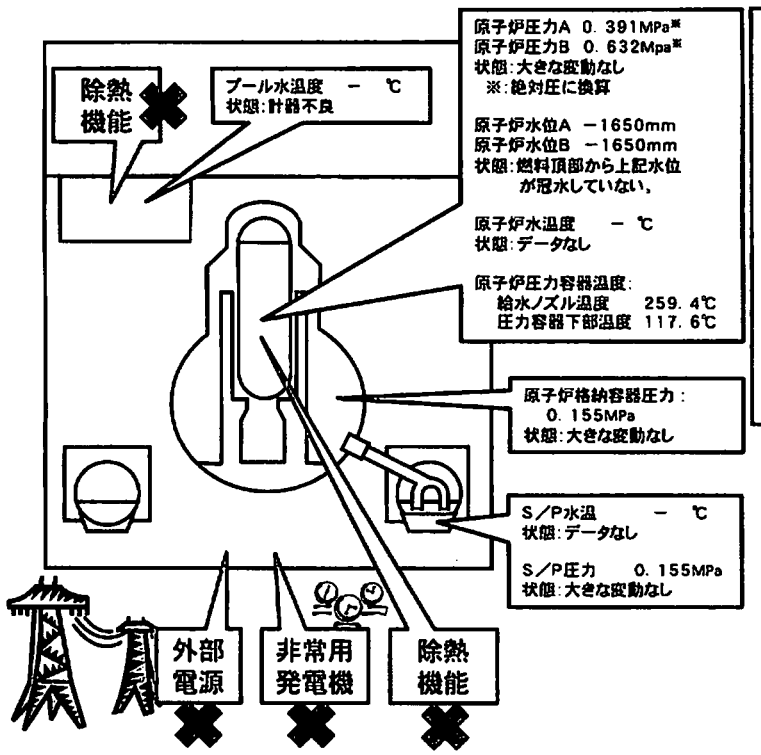
4月2日　14:00現在

※1：計器不良
※2：データ採取対象外

号機	1u	2u	3u	4u	5u	6u
注水状況	給水ラインを用いた淡水注入中。 流量 117l/min （4/1 16:18）　仮設計器	消火系ラインを用いた淡水注入中。 流量　150l/min （3/30 14:00）　仮設計器	消火系ラインを用いた淡水注入中。 流量 116l/min （3/29 14:39）　仮設計器	停止中	停止中	停止中
原子炉水位	燃料域A：−1650mm 燃料域B：−1650mm （4/2 12:00現在）	燃料域A：−1550mm （4/2 12:00現在）	燃料域A：−1850mm 燃料域B：−2250mm （4/2 12:10現在）	※2	停止域 1700mm （4/2 14:00現在）	停止域 2082mm （4/2 14:00現在）
原子炉圧力	0.290MPa g (A) 0.531MPa g (B) （4/2 12:00現在）	−0.007MPa g (A) −0.007MPa g (B) （4/2 12:00現在）	0.014MPa g (A) −0.095MPa g (C) （4/2 12:10現在）	※2	0.007MPa g （4/2 14:00現在）	0.005MPa g （4/2 14:00現在）
原子炉水温度	（系統流量がないため採取不可）			※2	30.4℃ （4/2 14:00現在）	31.8℃ （4/2 14:00現在）
原子炉圧力容器温度	給水ノズル温度：259.4℃ 圧力容器下部温度：117.6℃ （4/2 12:00現在）	給水ノズル温度：152.9℃ 圧力容器下部温度 ※1 （4/2 12:00現在）	給水ノズル温度：92.3℃(調査中) 圧力容器下部温度：117.8℃ （4/2 12:10現在）	4u:原子炉内に発熱体（燃料）なし 5,6u:原子炉水温度にて監視中		
D/W・S/C圧力	D/W　0.155MPa abs S/C　0.155MPa abs （4/2 12:00現在）	D/W　0.110MPa abs S/C　ダウンスケール (調査中) （4/2 12:00現在）	D/W　0.1050MPa abs S/C　0.1748MPa abs （4/2 12:10現在）	※2		
CAMS	D/W　4.51×10¹Sv/h S/C　1.60×10¹Sv/h （4/2 12:00現在）	D/W　3.57×10¹Sv/h S/C　9.66×10⁻¹Sv/h （4/2 12:00現在）	D/W　2.32×10¹Sv/h S/C　9.35×10⁻¹Sv/h （4/2 12:10現在）	※2		
D/W 器計使用圧力	0.384MPa g (0.485MPa abs)	0.384MPa g (0.485MPa abs)	0.384MPa g (0.485MPa abs)	※2		
D/W 最高使用圧力	0.427MPa g (0.528MPa abs)	0.427MPa g (0.528MPa abs)	0.427MPa g (0.528MPa abs)			
使用済燃料プール	※1	72.0℃ （4/2 12:00現在）	※1	※1	37.1℃ （4/2 14:00現在）	25.5℃ （4/2 14:00現在）
FPC スキマーサージ タンク レベル	4500mm （4/2 12:00現在）	5350mm （4/2 12:00現在）	※1	5100mm （4/2 12:10現在）	※2	
電源	外部電源受電中 (P/C2C)		外部電源受電中 (P/C4D)		外部電源受電中	
その他情報	・3号機　原子炉圧力容器温度について、データ採取を行い、状況推移を継続調査中。 ・2号機　S/C圧力について、状況推移を継続調査中。 ・5号機　4月2日2時、6時のデータの「その他情報」の記載を下記の通り訂正する。 （訂）5u：SHCモード (4/1 22:12~)			共用プール： 32℃程度 （4/2 7:30）	5u：SHCモード (4/1 22:12~)	6u：非常モード (4/2 10:30~)

圧力換算　ゲージ圧(MPa g) ＝ 絶対圧(MPa abs) − 大気圧(標準大気圧 0.1013 MPa)
絶対圧(MPa abs) ＝ ゲージ圧(MPa g) ＋ 大気圧(標準大気圧 0.1013 MPa)

福島第一原子力発電所1号機の状況
（4月2日　14:00現在）

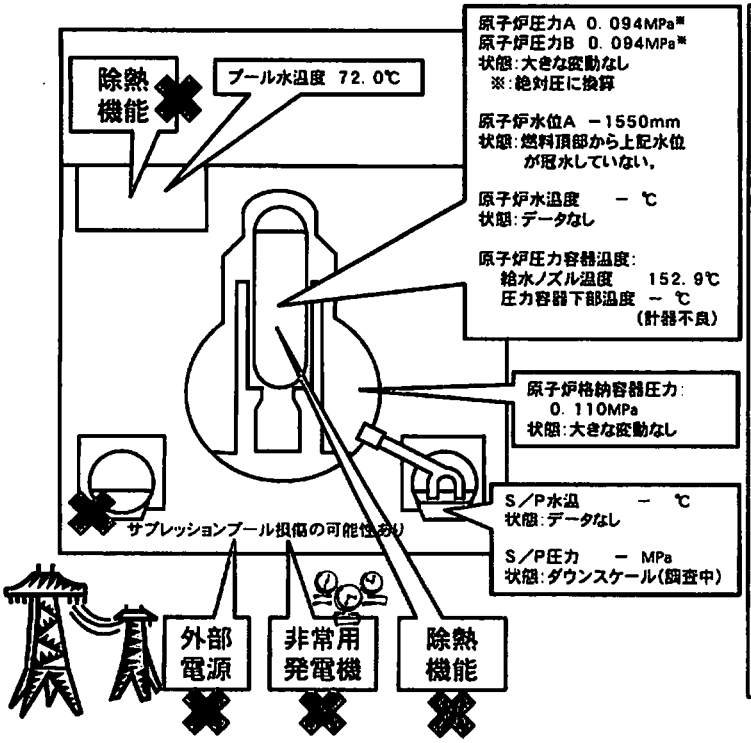


現状：プール及び炉心への淡水注入を継続

発生後の主要なできごと

11日14:46　運転中、地震により自動停止
11日15:42　10条通報（全交流電源喪失）
11日16:36　15条事象の発生（非常用炉心冷却装置注水不能）
12日01:20　15条事象の発生（格納容器圧力異常上昇）
12日10:17　ベント開始
12日15:36　爆発音
12日20:20　海水及びホウ酸の炉心注入開始
23日02:33　消火系に加え、給水系を使うことにより炉心への注水量を増量（2m³/h→18m³/h）。9:00に給水系のみに切替（18m³/h→11m³/h）
24日11:30　中央制御室の照明復帰
25日15:37　淡水の炉心注入開始
29日08:32　仮設電動ポンプでの炉心注水に切替
31日12:00　復水貯蔵タンク（CST）からサプレッションプール水サージタンク（SPT）へ移送開始
31日13:03～16:04 コンクリートポンプ車による放水（淡水）

福島第一原子力発電所2号機の状況
（4月2日　14:00現在）

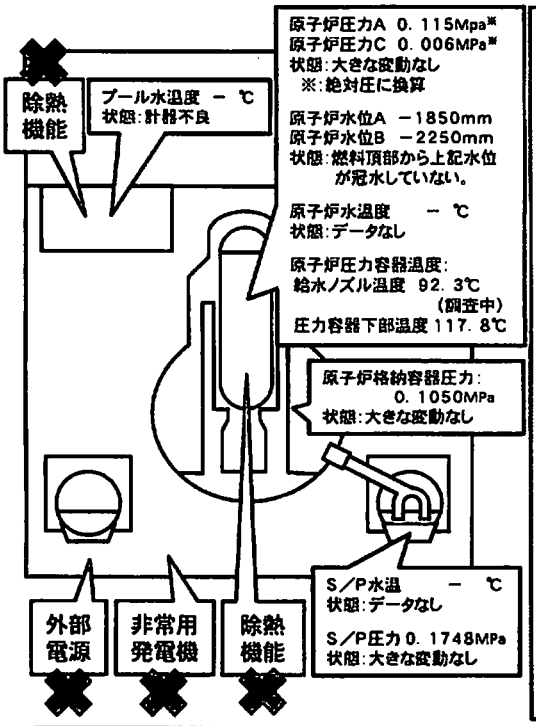


現状：プール及び炉心への淡水注入を継続

発生後の主要なできごと

11日14:46　運転中、地震により自動停止
11日15:42　10条通報（全交流電源喪失）
11日16:36　15条事象の発生（非常用炉心冷却装置注水不能）
13日11:00　ベント開始
14日13:25　15条事象の発生（原子炉冷却機能喪失）
14日16:34　海水の炉心注入開始
14日22:50　15条事象の発生（格納容器圧力異常上昇）
15日0:02　ベント開始
15日06:10　爆発音発生
15日06:20頃 サプレッションプール（圧力抑制室）損傷の可能性あり
20日15:05～17:20　使用済燃料プール冷却系（FPC）から使用済燃料プール（SFP）に約40tの海水を注水
20日15:46　パワーセンター受電
21日18:22　白煙が発生
22日7:11にほとんど見えない程度に減少
22日16:07　SFPに約18tの海水を注水
25日10:30～12:19　FPCからSFPに海水を注水
26日10:10　淡水の炉心注入開始
26日16:46　中央制御室の照明復帰
27日18:31　仮設電動ポンプでの炉心注水に切替
29日16:30～18:25　仮設電動ポンプに切替、SFPに淡水注入
29日16:45～1日11:50　復水貯蔵タンク（CST）からサプレッションプール水サージタンク（SPT）へ移送
30日9:25～23:50　SFPへ注水していたところ、仮設電動ポンプの不調を確認（9:45）。消防ポンプに切替えて注入するが、ホース破損が確認（12:47,13:10）されたため、注入中断。19:05に淡水注水を再開。
1日14:56～17:05 FPCからSFPへ仮設電動ポンプにより淡水注入

福島第一原子力発電所3号機の状況
（4月2日　14:00現在）



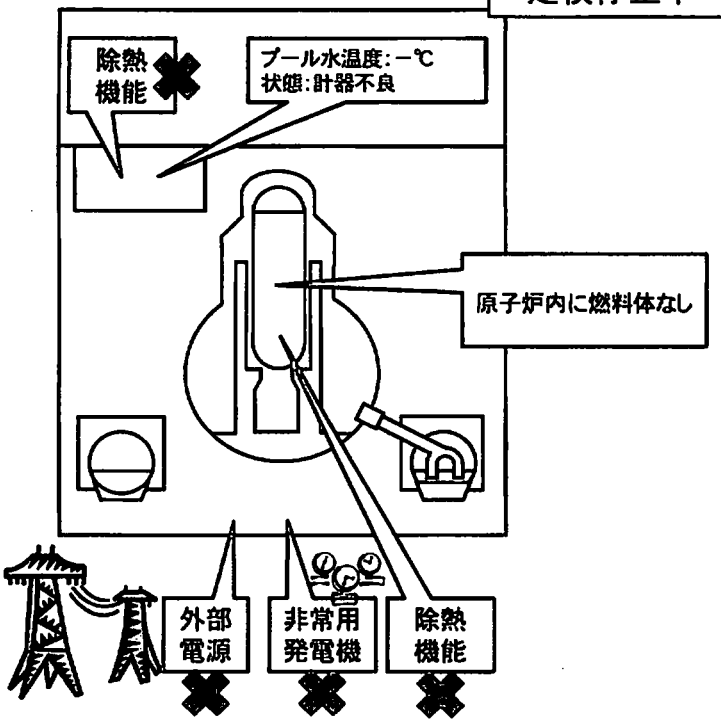
現状：
プール及び炉心への淡水注入を継続

発生後の主要なできごと

11日14:46　運転中、地震により自動停止
11日15:42　10条通報（全交流電源喪失）
13日05:10　15条事象の発生（非常用炉心冷却装置注水不能）
13日08:41　ベント開始
13日13:12　海水及びホウ酸の炉心注入開始
14日05:20　ベント開始
14日07:44　15条事象の発生（格納容器圧力異常上昇）
14日11:01　爆発音
16日08:30頃　白煙が発生
17日09:48～10:01　自衛隊ヘリによる放水
17日19:05～19:15　警察の高圧放水車による散水
17日19:35～20:09　自衛隊の消防車により放水
18日14時前～14:38　自衛隊消防車6台による地上放水～14:45　米軍消防車1台による地上放水
19日0:30～01:10　東京消防庁ハイパーレスキュー隊放水
19日14:10～20日3:40　東京消防庁ハイパーレスキュー隊放水
20日 11:00　格納容器内圧力が上昇（320kPa）。その後、低下。
20日21:36～21日3:58　東京消防庁ハイパーレスキュー隊放水
21日15:55頃　灰色がかった煙が発生。17:55に煙が収まっていることを確認
22日15:10～16:00　東京消防庁ハイパーレスキュー隊及び大阪市消防局放水
22日22:46　中央制御室の照明復帰
23日11:03-13:20 使用済燃料プール冷却系(FPC)から使用済燃料プール(SFP)に約35tの海水を注水
23日16:20頃　黒煙が発生。23:30頃及び24日4:50に煙の発生が止んでいることを確認。
24日05:35～16:05　FPCからSFPに約120tの海水を注水
25日13:28～16:00　東京消防庁の支援を受けた川崎市消防局による放水
25日18:02　淡水の炉心注入開始
27日12:34～14:36 コンクリートポンプ車による放水
28日17:40～31日8:40頃 復水貯蔵タンク(CST)からサプレッションプール水サージタンク(SPT)へ移送
28日20:30　仮設電動ポンプでの炉心注水に切替
29日14:17～18:18 コンクリートポンプ車による放水（淡水）
31日16:30～19:33 コンクリートポンプ車による放水（淡水）
2日09:52 ～12:54 コンクリートポンプ車による放水（淡水）

福島第一原子力発電所4号機の状況
（4月2日　14:00現在）

定検停止中



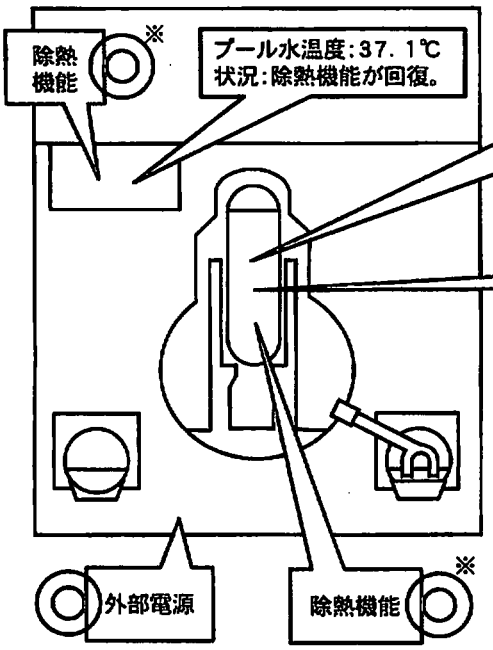
現状：原子炉圧力容器に燃料体が存在しない
プールへの淡水注入を継続

発生後の主要なできごと

地震発生時、定期検査により停止中
14日04:08　使用済燃料プール温度84℃
15日06:14　4Fの壁が一部破損の確認
15日09:38　3階部分で火災(12:25鎮火)
16日05:45　4号機で火災。事業者によると現場での火は確認できず(06:15)
20日08:21～9:40　自衛隊による使用済燃料プール（SFP）への放水
20日18:30頃 ～ 19:46　自衛隊によるSFPへの放水
21日06:37～08:41　自衛隊によるSFPへの放水
21日15:00頃　パワーセンターまでのケーブル敷設完了
22日10:35　パワーセンター受電
22日17:17～20:32　コンクリートポンプ車による放水
23日10:00～13:02　コンクリートポンプ車による放水
24日14:36～17:30　コンクリートポンプ車による放水
25日06:05～10:20　使用済燃料プール冷却系（FPC）からSFPに海水を注入
25日19:05～22:07 コンクリートポンプ車による放水
27日16:55～19:25　コンクリートポンプ車による放水
29日11:50　中央制御室の照明復帰
30日14:04～18:33　コンクリートポンプ車による放水（淡水）
1日8:28～14:14　コンクリートポンプ車による放水（淡水）

福島第一原子力発電所5号機の状況
（4月2日　14:00現在）

定検停止中



原子炉圧力:0.108MPa※
原子炉水位:1700mm
原子炉水温度:30.4℃
状況:操作により圧力等を制御中。
※:絶対圧に換算

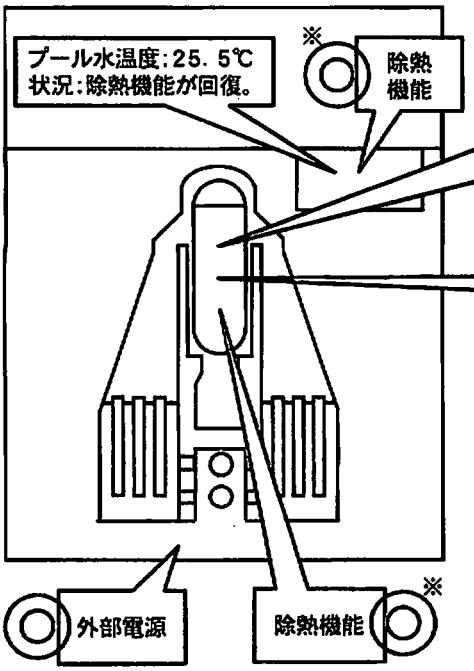
原子炉圧力容器温度:
原子炉水温度にて監視中。

現状:20日14:30　冷温停止。
21日11:36　外部電源から受電開始。
23日17:24　残留熱除去海水系(RHRS)ポンプが、仮設から本設の電源への切り替えの際に自動停止。
24日16:14　RHRSポンプの修理完了。
24日16:35　冷却開始。

※　炉水とプール水を切替えて除熱

福島第一原子力発電所6号機の状況
（4月2日　14:00現在）

定検停止中



原子炉圧力:0.106MPa※
原子炉水位:2082mm
原子炉水温度:31.8℃
状況:操作により圧力等を制御中。
※:絶対圧に換算

原子炉圧力容器温度:
原子炉水温度にて監視中

現状:20日19:27　冷温停止。
22日19:17　外部電源から受電開始。

※　炉水とプール水を切替えて除熱

Fukushima Di-ichi Nuclear Power Station Major Parameters of the Plant (As of 14:00, April 1st)

Unit No.	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Situation of water injection	Injecting fresh water via the Water Supply Line. Flow rate of injected water : 133 ℓ/min (As of 8:32, March 29th) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water :150 ℓ/min (As of 14:00, March 30th) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water: 116 ℓ/min (As of 14:39, March 29th) temporary measuring instrument	Under shutdown	Under shutdown	Under shutdown
Reactor water level	Fuel range A : -1,650mm Fuel range B : -1,650mm (As of 10:00, April 1st)	Fuel range A : -1,500mm (As of 10:00, April 1st)	Fuel range A:-1,900mm Fuel range B:-2,250mm (As of 11:45, April 1st)	#2	Shutdown range measurement 1,896mm (As of 14:00, April 1st)	Shutdown range measurement 1,640mm (As of 14:00, April 1st)
Reactor pressure	0.295MPa g(A) 0.497MPa g(B) (As of 10:00, April 1st)	-0.007MPa g (A) -0.009MPa g (B) (As of 10:00,April 1st)	0.016MPa g (A) -0.088MPa g (C) (As of 11:45, April 1st)	#2	0.006MPa g (As of 14:00, April 1st)	0.005MPa g (As of 14:00, April 1st)
Reactor water temperature	(Impossible collection due to low system flow rate)			#2	40.9℃ (As of 14:00, April 1st)	33.3℃ (As of 14:00, April 1st)
Reactor Pressure Vessel (RPV) temperature	Feedwater nozzle temperature: 248.6℃ Temperature at the bottom head of RPV: 118.5℃ (As of 10:00, April 1st)	Feedwater nozzle temperature: 161.0℃ Temperature at the bottom head of RPV: #1 (As of 10:00, April 1st)	Feedwater nozzle temperature: 90.2℃ (under survey) Temperature at the bottom head of RPV: 117.8℃ (As of 11:45, April 1st)	Unit 4 No heating element (fuel) inside the reactor Unit 5,6 Monitoring by the reactor water temperature		
D/W*1 Pressure, S/C*2 Pressure	D/W: 0.165MPa abs S/C: 0.165MPa abs (As of 10:00,April 1st)	D/W: 0.110MPa abs S/C:Down scale (under survey) (As of 10:00, April 1st)	D/W: 0.1068MPa abs S/C: 0.1757MPa abs (As of 11:45, April 1st)	#2		
CAMS*3	D/W: 4.30×10^{1}Sv/h S/C: 1.72×10^{1}Sv/h (As of 10:00, April 1st)	D/W: 3.70×10^{1}Sv/h S/C: 1.09×10^{0}Sv/h (As of 10:00,April 1st)	D/W: 2.42×10^{1}Sv/h S/C: 0.98×10^{0}Sv/h (As of 11:45, April 1st)	#2		
D/W*1 design operating pressure	0.384MPa g(0.485MPa abs)	0.384MPa g(0.485MPa abs)	0.384MPa g(0.485MPa abs)	#2		
D/W*1 maximum operating pressure	0.427MPa g(0.528MPa abs)	0.427MPa g(0.528MPa abs)	0.427MPa g(0.528MPa abs)			
Spent Fuel Pool water	#1	50.0℃ (As of 10:00, April 1st)	#1	#1	38.1℃ (As of 14:00, April 1st)	21.0℃ (As of 14:00, April 1st)
FPC skimmer level	4,500mm (As of 10:00, April 1st)	4,950mm (As of 10:00, April 1st)	#1	Down scale (As of 11:45, April 1st)	#2	
Power supply	Receiving external power supply (P/C*4 2C)		Receiving external power supply (P/C4D)		Receiving external power supply	

Other information	Unit3: Collecting the data of RPV temperature and continuing survey for transitional situation Unit2: Confirmed the indicated value of S/C Pressure but continuing to survey the transition of condition Unit4: Indication failure of FPC skimmer level by blow out of a fuse (as of 11:45). Now it has been recovered.	Common pool: about 32 ℃ (As of 7:30, April 1st)	Unit5:Nonthermal mode (From 10:58 April 1st)	Unit6:SHC*5 mode (From 11:39 April 1st)

Pressure conversion	Gauge pressure (MPa g) = Absolute pressure (MPa abs) – Atmospheric pressure (Normal atmospheric pressure 0.1013MPa) Absolute pressure (MPa abs) = Gauge pressure (MPa g) + Atmospheric pressure (Normal atmospheric pressure 0.1013MPa)

*1 D/W : Dry Well
*2 S/C : Suppression Chamber
*3 CAMS : Containment Atmospheric Monitoring System
*4 P/C : Power Center
*5 SHC : Shutdown Cooling

#1 : Measuring instrument malfunction
#2 : Except from data collection

April 1st, 2011

Fukushima Dai-ichi
Monitoring points

① North side of main office building(approx. 0.5km from Unit 2 in northwest direction)
② Near Gymnasium(East side of MP-5) (approx. 0.9km from Unit 2 in westnorthwest direction)
③ Near West Gate (near MP-5) (approx. 1.1km from Unit 2 in west direction)
④ Front of near Main Gate (near MP-6) (approx. 1.0km from Unit 2 in westnorthwest direction)
⑤ Front of Earthquake Isolation Building (approx. 0.5km from Unit2 in northwest dirction)
⑥ South side of main office building
⑦ Main Gate
MC: Monitoring Car TM: Transportable Monitoring post

Monitoring points		③																							
Reading time		12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:50
MC	Reading(μSv/h)	92.3	92.3	92.3	92.1	92.1	92.0	92.0	91.9	91.9	91.6	91.8	91.6	91.6	91.5	91.4	91.4	91.3	91.3	91.2	91.2	91.2	91.1		
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D		
TM	⑥SMOB(μSv/h)*1	890	-	-	900	-	-	900	-	-	900	-	-	910	-	-	900	-	-	910	-	-	900		
	⑦MG(μSv/h)*2	145	-	-	147	-	-	145	-	-	145	-	-	143	-	-	144	-	-	144	-	-	143		
	③WG(μSv/h)*3	67.4	-	-	65.2	-	-	65.8	-	-	65.5	-	-	65.2	-	-	64	-	-	64.5	-	-	64.6		
wind direction		E	E	SE	ESE	ESE	E	E	E	ESE	ESE	E	E	SSE	E	SE	SE	ESE	SE	E	E	ESE	ESE		
wind speed (m/s)		2.2	2.2	2.6	2.6	2.6	3.3	3.2	3.6	3.3	3.8	3.0	3.7	2.2	2.5	3.3	2.6	2.8	2.8	2.7	3.0	2.2	2.4		

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate

Monitoring points		③																							
Reading time		16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:50
MC	Reading(μSv/h)																								
	neutron																								
TM	⑥SMOB(μSv/h)*1																								
	⑦MG(μSv/h)*2																								
	③WG(μSv/h)*3																								
wind direction																									
wind speed (m/s)																									

Monitoring points		③																							
Reading time		20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:50
MC	Reading(μSv/h)																								
	neutron																								
TM	⑥SMOB(μSv/h)*1																								
	⑦MG(μSv/h)*2																								
	③WG(μSv/h)*3																								
wind direction																									
wind speed (m/s)																									

April 1st, 2011

Fukushima Dai-ichi
Monitoring points

① North side of main office building(approx. 0.5km from Unit 2 in northwest direction)
② Near Gymnasium(East side of MP-5) (approx. 0.9km from Unit 2 in westnorthwest direction)
③ Near West Gate (near MP-5) (approx. 1.1km from Unit 2 in west direction)
④ Front of near Main Gate (near MP-6) (approx. 1.0km from Unit 2 in westnorthwest direction)
⑤ Front of Earthquake Isolation Building (approx. 0.5km from Unit2 in northwest dirction)
⑥ South side of main office building
⑦ Main Gate
MC: Monitoring Car TM: Transportable Monitoring post

Monitoring points		③																							
Reading time		0:00	0:10	0:20	0:30	0:40	0:50	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00	3:10	3:20	3:30	3:40	3:50
MC	Reading(μSv/h)	94.3	94.3	94.2	94.1	94.1	94.1	93.9	93.9	93.9	93.9	98.9	93.7	93.7	93.8	93.7	93.4	93.5	93.4	93.3	93.3	93.3	93.4	93.3	93.2
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	940	-	—	940	-	—	940	-	—	940	-	—	940	-	—	940	-	—	940	-	—	940	-	—
	⑦MG(μSv/h)*2	145	—	—	145	—	—	145	—	—	145	—	—	146	—	—	146	—	—	145	—	—	146	—	—
	③WG(μSv/h)*3	69.3	—	—	68.9	—	—	68.6	—	—	68.7	—	—	68.8	—	—	68.7	—	—	68	—	—	68.3	—	—
wind direction		NW	WNW	W	NW	W	W	NW	WNW	W	NW	W	NW	WNW	WNW	W	NW	NW	NW	WNW	NW	W	W	W	WNW
wind speed (m/s)		0.6	0.7	0.8	0.4	0.6	0.6	0.8	0.8	0.8	0.5	0.8	0.7	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.6	0.6	0.8

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate

Monitoring points		③																							
Reading time		4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7:50
MC	Reading(μSv/h)	93.1	93.0	93.0	93.1	92.8	92.9	92.8	92.8	92.7	92.5	92.4	92.3	92.3	92.4	92.4	92.3	92.2	92.2	92.3	92.3	92.3	92.2	92.2	92.2
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	940	-	—	940	-	—	930	-	—	930	-	—	930	-	—	930	-	—	930	-	—	930	-	—
	⑦MG(μSv/h)*2	145	—	—	145	—	—	144	—	—	144	—	—	146	—	—	146	—	—	145	—	—	143	—	—
	③WG(μSv/h)*3	70	—	—	68.4	—	—	68.8	—	—	69	—	—	69.9	—	—	69	—	—	68.8	—	—	68.2	—	—
wind direction		W	W	W	W	W	W	W	W	W	W	W	W	WSW	WNW	W	W	WSW	WNW	WNW	NW	NNW	NNW	W	SW
wind speed (m/s)		0.8	0.7	0.7	0.6	0.6	0.7	0.7	0.8	0.7	0.7	0.8	0.8	0.7	0.9	1.0	0.8	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.4

Monitoring points		③																							
Reading time		8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
MC	Reading(μSv/h)	97.6	96.8	99.6	98.6	95.1	94.3	94.5	94.5	94.5	96.9	94.1	93.5	93.5	93.6	93.3	93.1	92.9	92.9	92.5	92.4	92.8	92.3	92.3	92.3
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	930	-	-	920	-	-	910	-	-	910	-	-	910	-	-	920	-	-	910	-	-	910	-	-
	⑦MG(μSv/h)*2	145	-	-	145	-	-	150	-	-	148	-	-	146	-	-	145	-	-	145	-	-	146	-	-
	③WG(μSv/h)*3	68.5	-	-	76.6	-	-	70.8	-	-	71.9	-	-	67.2	-	-	67.2	-	-	66.7	-	-	67.5	-	-
wind direction		E	SE	E	ESE	E	E	E	E	E	E	SE	ESE	ESE	E	E	SSE	E	ESE	E	E	ESE	S	S	S
wind speed (m/s)		1.6	1.7	2.3	2.5	2.2	2.5	2.6	3.1	3.1	3.0	3.1	3.0	2.2	2.6	3.2	3.0	2.8	2.4	2.4	3.0	2.2	1.7	2.4	2.2

March 31st, 2011

Fukushima Dai-ichi
Monitoring points

① North side of main office building(approx. 0.5km from Unit 2 in northwest direction)
② Near Gymnasium(East side of MP-5) (approx. 0.9km from Unit 2 in westnorthwest direction)
③ Near West Gate (near MP-5) (approx. 1.1km from Unit 2 in west direction)
④ Front of near Main Gate (near MP-6) (approx. 1.0km from Unit 2 in westnorthwest direction)
⑤ Front of Earthquake Isolation Building (approx. 0.5km from Unit2 in northwest dirction)
⑥ South side of main office building
⑦ Main Gate
MC: Monitoring Car TM: Transportable Monitoring post

Monitoring points		③																							
Reading time		12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:50
MC	Reading(μSv/h)	98.9	98.1	97.9	97.7	98.7	97.9	97.7	100.8	100.5	99.2	99.6	97.6	99.9	97.6	96.8	96.5	96.5	96.6	96.5	96.7	96.7	96.9	98.1	99.1
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	950	-	—	940	-	—	940	-	—	940	-	—	940	-	—	930	-	—	930	-	—	930	-	—
	⑦MG(μSv/h)*2	155	—	—	155	—	—	162	—	—	157	—	—	157	—	—	153	—	—	150	—	—	151	—	—
	③WG(μSv/h)*3	70.3	—	—	70.8	—	—	68.8	—	—	72.0	—	—	69.3	—	—	69.4	—	—	69.7	—	—	69.6	—	—
wind direction		E	NE	N	E	E	E	E	E	NE	NE	SE	SE	E	NNE	SE	E	W	SW	NW	E	NNE	E	E	E
wind speed (m/s)		2.3	1.3	1.0	1.8	1.7	1.8	2.3	2.5	2.7	2.3	2.6	2.3	2.0	1.4	0.8	0.6	0.5	0.7	0.7	0.5	0.6	0.5	1.2	0.8

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate

Monitoring points		③																							
Reading time		16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:50
MC	Reading(μSv/h)	107	108.2	98.6	98.0	98.1	97.9	97.7	97.6	97.6	97.3	97.2	97.0	97.0	96.9	96.8	96.7	96.5	96.5	96.3	96.4	96.3	96.1	96.3	96.1
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	950	-	—	930	-	—	930	-	—	930	-	—	930	-	—	930	-	—	940	-	—	940	-	—
	⑦MG(μSv/h)*2	154	—	—	164	—	—	154	—	—	150	—	—	151	—	—	149	—	—	148	—	—	148	—	—
	③WG(μSv/h)*3	82.8	—	—	71.5	—	—	70	—	—	69.4	—	—	68.3	—	—	70.1	—	—	67.8	—	—	68.4	—	—
wind direction		SE	E	SE	E	E	E	NE	N	NW	WSW	E	NE	SW	WNW	NNE	NNW	NW	W	W	W	NW	NW	WNW	NW
wind speed (m/s)		1.5	1.8	1.8	1.0	1.5	0.9	0.7	0.4	0.5	0.5	0.4	0.6	0.5	0.7	0.7	0.3	0.4	0.7	0.3	0.6	0.8	0.7	1.0	1.2

Monitoring points		③																							
Reading time		20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:50
MC	Reading(μSv/h)	96.2	96.2	96.0	95.9	95.9	95.7	95.7	95.6	95.4	95.3	95.3	95.3	95.2	95.3	95.0	94.9	95.1	94.8	94.8	94.8	94.7	94.7	94.6	94.7
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	940	-	—	940	-	—	940	-	—	940	-	—	940	-	—	940	-	—	940	-	—	940	-	—
	⑦MG(μSv/h)*2	148	—	—	148	—	—	148	—	—	148	—	—	148	—	—	146	—	—	148	—	—	145	—	—
	③WG(μSv/h)*3	70.9	—	—	70.6	—	—	69.9	—	—	70.5	—	—	69.6	—	—	72.1	—	—	69.9	—	—	69.9	—	—
wind direction		NW	WNW	NW	NW	NE	NW	NNE	W	NW	NW	NW	NNW	W	NW	W	W	W	W	WSW	NW	W	W	W	W
wind speed (m/s)		1.1	1.4	1.3	0.9	0.8	0.8	0.5	0.3	0.3	0.4	0.4	0.2	0.4	0.5	0.7	1.0	0.7	0.7	0.8	0.8	0.5	0.4	0.5	0.7

March 31st, 2011

Fukushima Dai-ichi
Monitoring points

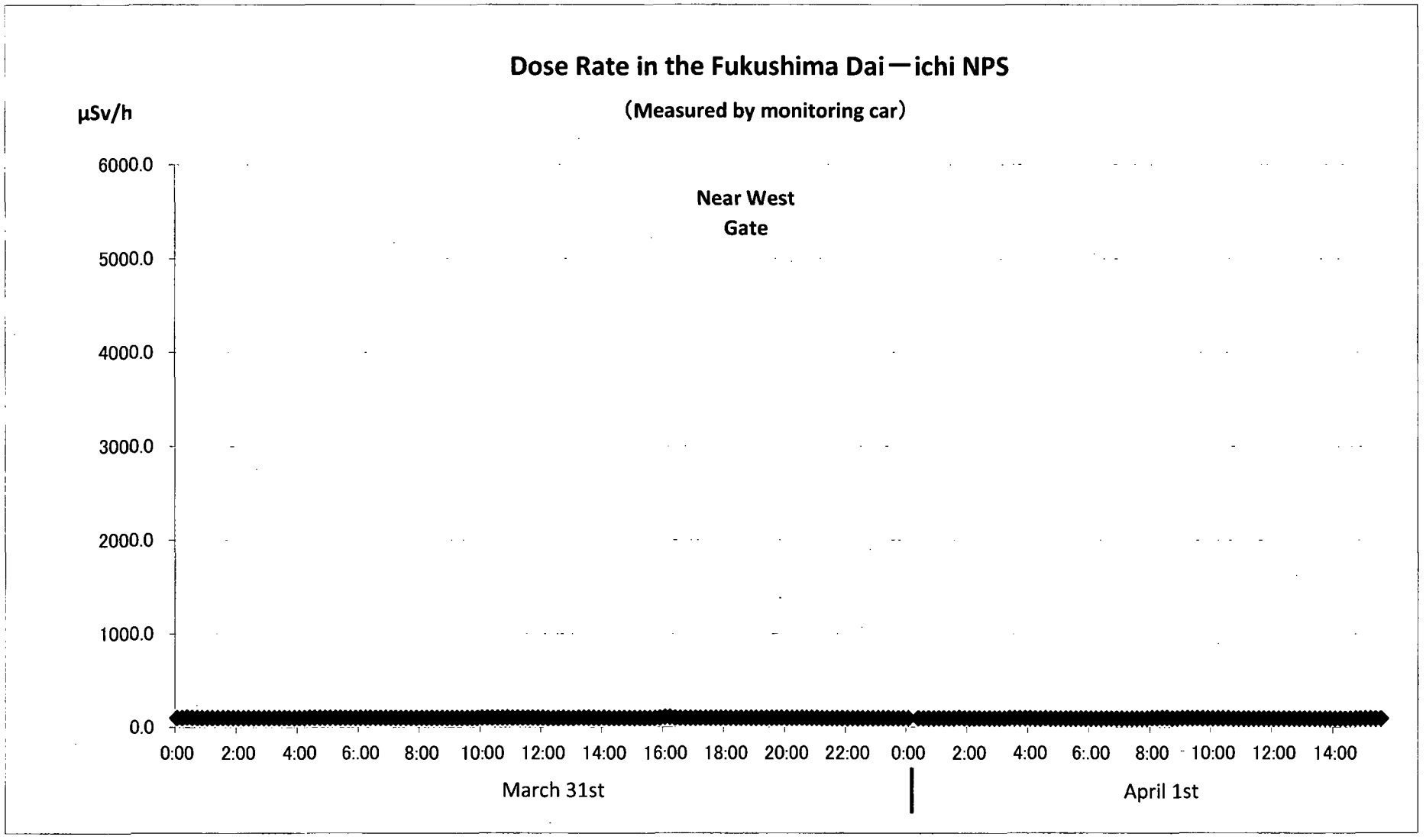
① North side of main office building(approx. 0.5km from Unit 2 in northwest direction)
② Near Gymnasium(East side of MP-5) (approx. 0.9km from Unit 2 in westnorthwest direction)
③ Near West Gate (near MP-5) (approx. 1.1km from Unit 2 in west direction)
④ Front of near Main Gate (near MP-6) (approx. 1.0km from Unit 2 in westnorthwest direction)
⑤ Front of Earthquake Isolation Building (approx. 0.5km from Unit2 in northwest dirction)
⑥ South side of main office building
⑦ Main Gate
MC: Monitoring Car TM: Transportable Monitoring post

Monitoring points		③																							
Reading time		0:00	0:10	0:20	0:30	0:40	0:50	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00	3:10	3:20	3:30	3:40	3:50
MC	Reading(μSv/h)	100.8	100.8	105.4	101.0	100.4	100.3	100.2	100.4	100.3	100.1	100.2	100.1	100.0	100.0	100.0	100.1	100.0	100.1	99.9	100.3	100.1	100.0	100.1	99.9
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	990	-	—	1,000	-	—	990	-	—	990	-	—	1,000	-	—	990	-	—	990	-	—	990	-	—
	⑦MG(μSv/h)*2	154	—	—	152	—	—	154	—	—	152	—	—	152	—	—	153	—	—	152	—	—	151	—	—
	③WG(μSv/h)*3	71.5	—	—	73.6	—	—	72.2	—	—	71.9	—	—	71.3	—	—	72.5	—	—	71.9	—	—	70.5	—	—
wind direction		NE	SE	S	NE	WNW	NE	NE	NE	NE	E	SSW	SSE	WSW	SSE	ENE	WSW	WNW	S	SW	NE	WSW	WNW	W	NE
wind speed (m/s)		3.9	0.9	2.8	4.3	1.6	4.0	5.8	5.9	6.0	2.1	0.5	0.5	0.8	0.9	0.9	1.8	2.2	3.6	2.2	4.7	4.3	1.8	0.6	0.3

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate

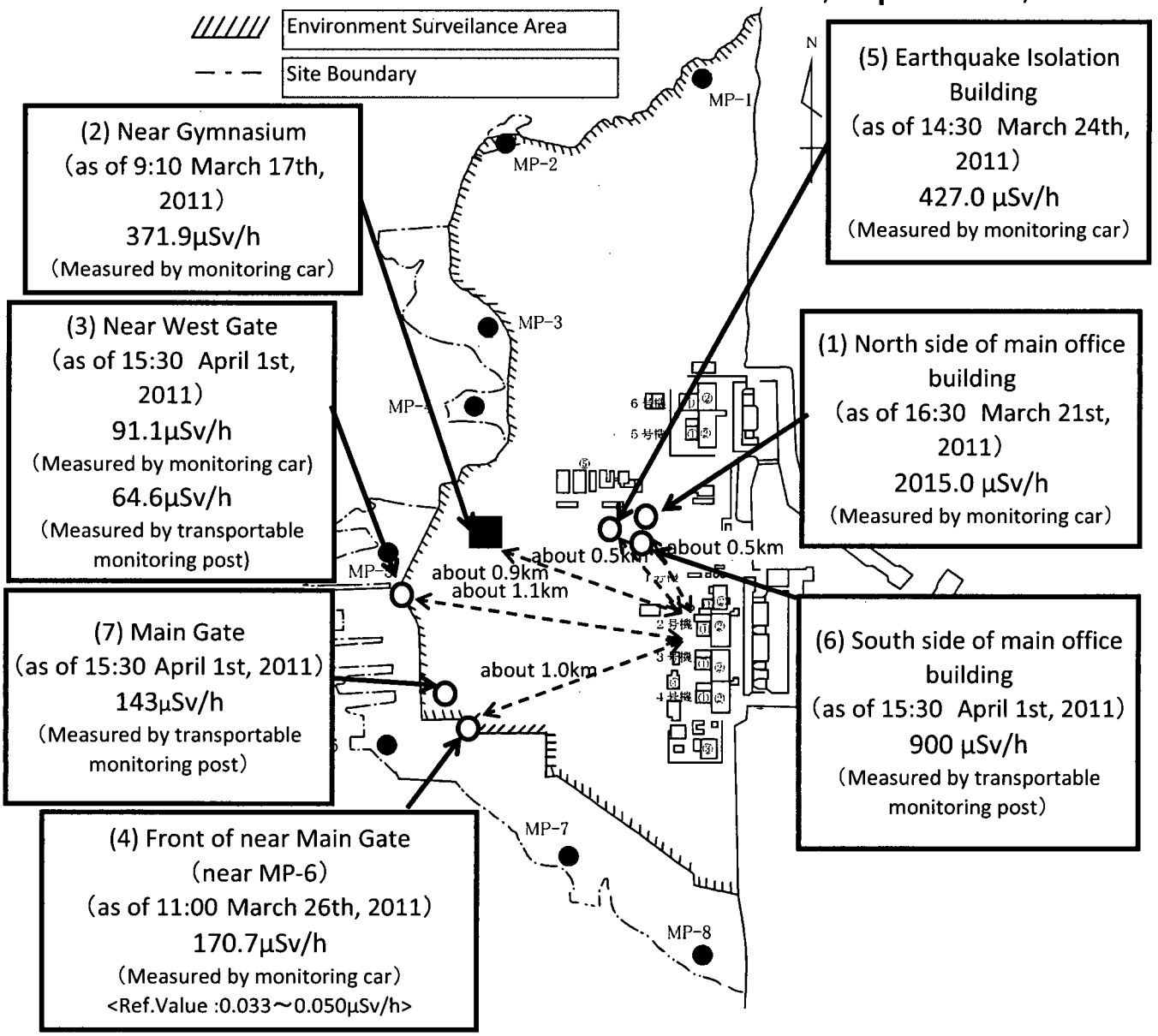
Monitoring points		③																							
Reading time		4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7:50
MC	Reading(μSv/h)	99.9	99.9	99.9	99.9	99.9	99.8	99.7	99.8	99.7	99.6	99.6	99.5	99.4	99.3	99.4	99.4	99.4	99.3	99.3	99.2	99.2	99.3	99.0	99.2
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	990	-	—	990	-	—	990	-	—	980	-	—	990	-	—	980	-	—	990	-	—	980	-	—
	⑦MG(μSv/h)*2	152	—	—	152	—	—	150	—	—	151	—	—	152	—	—	152	—	—	150	—	—	150	—	—
	③WG(μSv/h)*3	70.9	—	—	71.2	—	—	71.2	—	—	70.9	—	—	72	—	—	71.8	—	—	72.9	—	—	71.4	—	—
wind direction		WSW	WSW	NE	SSW	SW	NE	NE	NE	NE	NE	NE	NE	WSW	NE	NE	NE	W	NW	W	W	W	NW	NW	W
wind speed (m/s)		3.4	0.5	0.7	2.4	0.4	2.4	0.7	4.3	5.6	5.7	5.5	3.9	2.2	3.0	2.1	4.9	1.5	0.7	0.6	0.5	0.9	0.5	0.5	1.0

Monitoring points		③																							
Reading time		8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
MC	Reading(μSv/h)	99.0	99.0	98.9	98.7	98.4	98.4	98.5	98.6	98.6	98.6	98.4	98.7	98.5	98.4	99.9	98.6	100.0	100.9	98.7	98.5	100.6	98.6	98.4	98.3
	neutron	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
TM	⑥SMOB(μSv/h)*1	980	-	—	980	—	—	970	—	—	970	—	—	970	—	—	960	—	—	960	—	—	950	—	—
	⑦MG(μSv/h)*2	150	—	—	150	—	—	149	—	—	149	—	—	151	—	—	160	—	—	158	—	—	159	—	—
	③WG(μSv/h)*3	72.1	—	—	69.6	—	—	71	—	—	72.9	—	—	70	—	—	70.1	—	—	72.4	—	—	72.5	—	—
wind direction		N	NNW	W	NE	W	N	N	NW	NW	NW	NW	NNW	NW	WNW	NNE	E	E	E	E	E	E	E	E	ENE
wind speed (m/s)		0.9	0.7	1.5	1.1	1.6	1.0	0.9	1.2	1.0	0.7	0.7	0.7	0.7	9.0	1.5	1.8	0.5	2.9	3.1	2.9	3.7	3.6	3.3	2.5


Dose Rate in the Fukushima Dai－ichi NPS
(Measured by monitoring car)
μSv/h
6000.0
5000.0
4000.0
3000.0
2000.0
1000.0
0.0
Near West
Gate
0:00
2:00
4:00
6:.00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
2:00
4:00
6:.00
8:00
10:00
12:00
14:00
March 31st
April 1st

Fukushima Dai－ichi NPS

as of 17:00, April 1st, 2011



Fukushima Dai-ni (TEPCO's Monitaring Post)

April 1, 2011																								
monitoring point	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:50
MP1(μSv/h)	7.110	7.073	7.100	7.103	7.077	7.070	7.097	7.120	7.070	7.090	7.090	7.070	7.083	7.070	7.073	7.057	7.043	7.063	7.087	7.057	7.040	6.997		
MP2(μSv/h)	3.767	3.767	3.763	3.760	3.747	3.750	3.753	3.733	3.720	3.753	3.747	3.733	3.727	3.743	3.730	3.737	3.733	3.710	3.733	3.710	3.723	3.713		
MP3(μSv/h)	6.563	6.567	6.507	6.487	6.523	6.510	6.517	6.537	6.497	6.497	6.477	6.493	6.493	6.483	6.480	6.493	6.477	6.430	6.477	6.467	6.467	6.423		
MP4(μSv/h)	4.727	4.727	4.727	4.713	4.730	4.743	4.717	4.717	4.687	4.710	4.697	4.687	4.683	4.687	4.677	4.700	4.677	4.687	4.670	4.677	4.660	4.660		
MP5(μSv/h)	4.473	4.473	4.420	4.420	4.420	4.420	4.427	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420	4.420		
MP6(μSv/h)	5.737	5.717	5.710	5.697	5.707	5.697	5.690	5.700	5.677	5.703	5.687	5.710	5.693	5.687	5.713	5.697	5.683	5.667	5.700	5.690	5.693	5.690		
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
wind direction	SE	SSE	SSE	SSE	SSE	SE	SSE	SE	SE	E	SSE	S	S	S	S	S	S	S	SSE	S	S	S		
wind speed (m/s)	2.5	2.5	3.8	4.9	4.3	5.1	5.4	4.1	3.7	3.1	6.1	9.8	9.1	9.3	9.9	9.4	11.7	12.6	10.2	11.3	11.8	10.4		

April 1, 2011																								
monitoring point	16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:50
MP1(μSv/h)																								
MP2(μSv/h)																								
MP3(μSv/h)																								
MP4(μSv/h)																								
MP5(μSv/h)																								
MP6(μSv/h)																								
MP7(μSv/h)																								
wind direction																								
wind speed (m/s)																								

April 1, 2011																								
monitoring point	20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:50
MP1(μSv/h)																								
MP2(μSv/h)																								
MP3(μSv/h)																								
MP4(μSv/h)																								
MP5(μSv/h)																								
MP6(μSv/h)																								
MP7(μSv/h)																								
wind direction																								
wind speed (m/s)																								

Fukushima Dai-ni (TEPCO's Monitaring Post)

April 1, 2011																								
monitoring point	0:00	0:10	0:20	0:30	0:40	0:50	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00	3:10	3:20	3:30	3:40	3:50
MP1(μSv/h)	7.303	7.317	7.287	7.313	7.260	7.300	7.273	7.253	7.313	7.307	7.287	7.283	7.260	7.257	7.260	7.270	7.257	7.227	7.227	7.223	7.257	7.253	7.243	7.220
MP2(μSv/h)	3.840	3.850	3.837	3.833	3.863	3.833	3.860	3.860	3.843	3.817	3.830	3.820	3.833	3.853	3.830	3.840	3.833	3.817	3.813	3.813	3.813	3.803	3.810	3.837
MP3(μSv/h)	6.730	6.673	6.717	6.733	6.743	6.713	6.710	6.690	6.713	6.690	6.693	6.707	6.697	6.693	6.687	6.683	6.687	6.663	6.670	6.673	6.670	6.640	6.637	6.643
MP4(μSv/h)	4.893	4.857	4.883	4.867	4.883	4.850	4.870	4.870	4.847	4.863	4.850	4.847	4.840	4.833	4.837	4.843	4.843	4.820	4.820	4.823	4.813	4.840	4.830	4.823
MP5(μSv/h)	4.620	4.613	4.620	4.613	4.620	4.613	4.613	4.613	4.613	4.587	4.613	4.613	4.613	4.620	4.620	4.567	4.613	4.620	4.573	4.567	4.567	4.540	4.520	4.540
MP6(μSv/h)	5.840	5.823	5.830	5.823	5.850	5.827	5.817	5.830	5.827	5.793	5.810	5.823	5.807	5.820	5.803	5.793	5.800	5.767	5.770	5.800	5.790	5.773	5.790	5.790
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NW
wind speed (m/s)	6.8	6.2	5.6	5.7	4.8	4.9	4.7	4.4	5.0	5.6	5.4	4.9	4.3	3.9	3.6	4.1	4.7	5.2	5.0	4.4	4.7	6.1	5.1	4.7

April 1, 2011																								
monitoring point	4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7:50
MP1(μSv/h)	7.223	7.240	7.210	7.200	7.207	7.210	7.223	7.223	7.190	7.190	7.183	7.167	7.193	7.183	7.150	7.167	7.187	7.183	7.160	7.160	7.170	7.150	7.157	7.173
MP2(μSv/h)	3.813	3.803	3.790	3.817	3.803	3.790	3.807	3.780	3.803	3.803	3.780	3.773	3.793	3.787	3.780	3.793	3.777	3.780	3.773	3.783	3.770	3.783	3.787	3.767
MP3(μSv/h)	6.633	6.653	6.647	6.643	6.623	6.640	6.620	6.647	6.617	6.603	6.583	6.590	6.610	6.630	6.617	6.593	6.603	6.597	6.567	6.577	6.587	6.653	6.580	6.603
MP4(μSv/h)	4.820	4.807	4.810	4.810	4.800	4.800	4.793	4.783	4.803	4.793	4.807	4.790	4.800	4.790	4.793	4.773	4.770	4.770	4.803	4.787	4.793	4.750	4.773	4.767
MP5(μSv/h)	4.567	4.513	4.573	4.520	4.513	4.540	4.520	4.513	4.520	4.520	4.520	4.520	4.520	4.520	4.520	4.520	4.520	4.520	4.513	4.513	4.520	4.520	4.520	4.520
MP6(μSv/h)	5.807	5.787	5.753	5.770	5.767	5.780	5.770	5.757	5.757	5.753	5.743	5.767	5.750	5.743	5.753	5.767	5.740	5.730	5.720	5.743	5.737	5.720	5.733	5.733
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	WNW	WSW	W	WNW	N
wind speed (m/s)	4.0	4.4	5.0	5.0	5.1	4.5	4.5	4.7	4.6	4.2	4.2	4.1	3.5	3.4	4.1	3.6	3.3	2.8	2.9	1.9	0.5	0.8	0.5	0.8

April 1, 2011																								
monitoring point	8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
MP1(μSv/h)	7.143	7.153	7.143	7.130	7.153	7.123	7.113	7.157	7.140	7.263	7.233	7.230	7.207	7.163	7.160	7.150	7.133	7.130	7.083	7.110	7.100	7.127	7.123	7.103
MP2(μSv/h)	3.787	3.767	3.770	3.777	3.757	3.773	3.780	3.783	3.760	3.833	3.907	3.870	3.843	3.807	3.770	3.777	3.757	3.757	3.753	3.747	3.757	3.743	3.767	3.773
MP3(μSv/h)	6.657	6.603	6.583	6.583	6.550	6.547	6.567	6.547	6.553	6.557	6.620	6.663	6.630	6.617	6.577	6.550	6.550	6.563	6.543	6.543	6.540	6.520	6.510	6.563
MP4(μSv/h)	4.773	4.767	4.777	4.790	4.783	4.777	4.757	4.753	4.747	4.767	4.783	4.840	4.843	4.787	4.770	4.753	4.763	4.743	4.733	4.733	4.730	4.740	4.730	4.767
MP5(μSv/h)	4.520	4.520	4.520	4.513	4.513	4.520	4.520	4.520	4.520	4.520	4.520	4.520	4.620	4.520	4.520	4.500	4.467	4.500	4.467	4.420	4.420	4.440	4.467	4.493
MP6(μSv/h)	5.743	5.723	5.703	5.713	5.743	5.717	5.703	5.730	5.713	5.723	5.707	5.783	5.820	5.797	5.737	5.707	5.743	5.723	5.730	5.700	5.713	5.720	5.713	5.747
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	NNW	NNE	ENE	ESE	E	E	ESE	E	ESE	SE	ESE	ESE	ESE	SE	SE	ESE	ESE	SE	ESE	ESE	ESE	SE	SE	SE
wind speed (m/s)	0.8	0.3	0.8	1.6	2.5	2.9	2.7	3.6	3.6	3.3	3.5	3.5	4.1	3.3	3.3	2.5	2.5	3.3	3.1	3.8	2.4	3.4	4.2	3.0

Fukushima Dai-ni (TEPCO's Monitaring Post)

March 31, 2011																								
monitoring point	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:50
MP1(μSv/h)	7.600	7.603	7.630	7.647	7.610	7.607	7.603	7.590	7.590	7.610	7.560	7.587	7.577	7.563	7.503	7.503	7.497	7.497	7.493	7.510	7.517	7.517	7.507	7.510
MP2(μSv/h)	4.013	4.027	4.033	4.023	4.017	3.997	4.020	4.023	4.017	4.020	4.017	4.010	4.007	4.003	3.970	3.970	3.977	3.977	3.967	3.973	3.990	3.960	3.977	3.980
MP3(μSv/h)	6.977	6.993	7.020	6.957	6.957	6.967	6.957	6.967	6.980	6.970	6.950	6.947	6.943	6.953	6.890	6.890	6.897	6.893	6.907	6.860	6.910	6.863	6.890	6.893
MP4(μSv/h)	5.390	5.397	5.417	5.417	5.393	5.403	5.397	5.410	5.403	5.393	5.390	5.380	5.387	5.407	5.363	5.363	5.350	5.343	5.007	4.993	4.990	5.000	5.023	4.983
MP5(μSv/h)	4.793	4.807	4.813	4.813	4.813	4.813	4.760	4.760	4.713	4.760	4.760	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713
MP6(μSv/h)	6.017	6.037	6.043	6.010	6.037	6.007	6.050	6.010	6.007	6.037	6.030	6.000	6.033	6.013	5.960	5.960	5.960	5.967	5.947	5.950	5.970	5.993	5.950	5.960
MP7(μSv/h)	3.250	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	E	ENE	ENE	NE	NE	NE	NE	NE	NE	ENE	ESE	ESE	ENE	E	NE	NE	NW	NW	WNW	NNW	NW	NNW	NNW	N
wind speed (m/s)	4.0	4.6	6.0	5.1	3.0	3.5	3.9	2.9	3.7	2.7	2.0	1.7	3.2	2.6	6.0	6.0	5.9	6.9	9.9	7.8	5.3	5.2	4.6	3.2

March 31, 2011																								
monitoring point	16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:50
MP1(μSv/h)	7.507	7.493	7.527	7.550	7.530	7.457	7.480	7.483	7.483	7.490	7.453	7.533	7.477	7.520	7.507	7.540	7.470	7.470	7.443	7.407	7.420	7.437	7.417	7.410
MP2(μSv/h)	3.977	3.987	3.997	4.013	4.023	3.960	3.943	3.963	3.963	3.943	3.943	3.990	4.003	4.000	4.003	4.017	3.973	3.960	3.950	3.937	3.927	3.920	3.927	3.923
MP3(μSv/h)	6.900	6.900	6.883	6.940	6.957	6.907	6.900	6.890	6.893	6.880	6.880	6.920	6.940	6.887	6.910	6.893	6.860	6.837	6.847	6.827	6.830	6.847	6.840	6.833
MP4(μSv/h)	5.007	5.007	5.000	5.027	5.083	5.020	5.023	4.970	4.983	4.987	4.993	4.993	5.033	5.027	5.033	5.023	4.987	4.983	4.970	4.953	4.933	4.953	4.937	4.950
MP5(μSv/h)	4.713	4.713	4.713	4.713	4.807	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.713	4.687	4.667	4.713	4.660	4.693
MP6(μSv/h)	5.967	5.967	5.987	5.997	6.020	5.930	5.983	5.967	5.950	5.937	5.940	5.960	5.957	5.957	5.943	5.957	5.960	5.963	5.947	5.943	5.917	5.920	5.903	5.927
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	ENE	NE	NE	NE	NE	NE	NE	NNE	N	N	N	NW	WNW	NE	NNW	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW
wind speed (m/s)	2.5	4.4	4.5	3.3	3.8	3.0	2.2	1.8	1.0	1.8	1.6	3.0	3.3	1.0	1.6	2.8	4.8	5.2	5.6	7.0	7.1	6.7	6.3	6.8

March 31, 2011																								
monitoring point	20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:50
MP1(μSv/h)	7.413	7.397	7.423	7.403	7.380	7.400	7.420	7.360	7.390	7.370	7.380	7.390	7.377	7.363	7.347	7.367	7.337	7.343	7.347	7.337	7.333	7.303	7.330	7.307
MP2(μSv/h)	3.907	3.937	3.920	3.917	3.907	3.907	3.907	3.887	3.897	3.890	3.900	3.870	3.877	3.873	3.887	3.887	3.887	3.870	3.857	3.863	3.867	3.867	3.843	3.857
MP3(μSv/h)	6.810	6.797	6.820	6.820	6.790	6.830	6.793	6.790	6.770	6.780	6.773	6.777	6.747	6.790	6.763	6.760	6.743	6.750	6.733	6.723	6.747	6.700	6.717	6.723
MP4(μSv/h)	4.950	4.953	4.930	4.923	4.943	4.930	4.923	4.940	4.920	4.923	4.900	4.907	4.930	4.903	4.910	4.880	4.887	4.900	4.893	4.890	4.880	4.897	4.890	4.893
MP5(μSv/h)	4.713	4.667	4.613	4.613	4.660	4.640	4.613	4.613	4.620	4.613	4.613	4.613	4.660	4.613	4.613	4.620	4.620	4.620	4.613	4.613	4.613	4.613	4.620	4.613
MP6(μSv/h)	5.893	5.900	5.903	5.893	5.917	5.900	5.870	5.907	5.910	5.877	5.870	5.877	5.877	5.893	5.880	5.870	5.857	5.897	5.860	5.877	5.867	5.857	5.863	5.847
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	NNW	NNW	NW	NW	NW	NW	NW	NW	NW	NNW
wind speed (m/s)	7.8	8.1	6.7	5.5	6.0	5.7	5.7	5.6	6.0	5.5	4.6	5.2	4.8	4.8	4.6	6.3	6.3	5.2	6.4	6.9	7.4	7.4	7.9	7.1

Fukushima Dai-ni (TEPCO's Monitaring Post)

March 31, 2011																								
monitoring point	0:00	0:10	0:20	0:30	0:40	0:50	1:00	1:10	1:20	1:30	1:40	1:50	2:00	2:10	2:20	2:30	2:40	2:50	3:00	3:10	3:20	3:30	3:40	3:50
MP1(μSv/h)	7.780	7.757	7.757	7.750	7.733	7.750	7.690	7.697	7.713	7.680	7.657	7.657	7.653	7.667	7.680	7.677	7.643	7.677	7.647	7.640	7.623	7.623	7.593	7.607
MP2(μSv/h)	4.113	4.097	4.097	4.103	4.067	4.067	4.073	4.040	4.050	4.067	4.043	4.030	4.027	4.033	4.033	4.037	4.040	4.047	4.017	4.027	4.037	4.030	4.013	4.017
MP3(μSv/h)	7.203	7.193	7.173	7.203	7.140	7.157	7.140	7.120	7.140	7.157	7.123	7.117	7.127	7.113	7.113	7.123	7.130	7.143	7.107	7.113	7.083	7.060	7.070	7.077
MP4(μSv/h)	5.623	5.537	5.557	5.543	5.527	5.527	5.510	5.510	5.530	5.520	5.517	5.507	5.510	5.493	5.507	5.510	5.487	5.517	5.527	5.453	5.473	5.487	5.470	5.477
MP5(μSv/h)	4.960	4.913	4.913	4.913	4.913	4.907	4.907	4.913	4.913	4.873	4.853	4.907	4.867	4.893	4.860	4.913	4.913	4.907	4.907	4.873	4.860	4.840	4.853	4.867
MP6(μSv/h)	6.143	6.120	6.120	6.143	6.120	6.113	6.123	6.097	6.093	6.117	6.073	6.120	6.080	6.073	6.073	6.080	6.100	6.090	6.060	6.070	6.067	6.077	6.057	6.070
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	NNW	NNW	N	NNE	NNE	NNE	N	WNW	NW	NNW	NE	NNE	ENE	ENE	E	WSW	ESE	SE	SSE	SSE	SW	SSW	SSW	SSE
wind speed (m/s)	4.4	3.1	2.5	2.5	1.0	0.7	0.2	0.2	0.7	0.2	1.1	1.2	0.8	0.4	0.4	0.0	1.8	2.2	1.3	1.4	1.5	1.4	1.6	0.5

March 31, 2011																								
monitoring point	4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7:50
MP1(μSv/h)	7.630	7.590	7.613	7.587	7.580	7.577	7.583	7.577	7.580	7.580	7.560	7.543	7.543	7.557	7.573	7.530	7.540	7.537	7.527	7.533	7.563	7.527	7.553	7.513
MP2(μSv/h)	4.030	4.023	3.993	4.000	3.987	3.973	4.023	4.003	4.000	3.993	4.000	3.987	3.993	3.990	4.000	3.983	3.987	3.970	3.987	3.980	3.987	3.983	3.987	3.960
MP3(μSv/h)	7.057	7.083	7.050	7.063	7.073	7.077	7.040	7.063	7.037	7.067	7.047	7.027	7.003	7.040	7.053	7.050	7.043	7.050	6.997	7.010	7.037	7.027	6.987	7.033
MP4(μSv/h)	5.473	5.467	5.477	5.490	5.483	5.483	5.463	5.460	5.473	5.443	5.453	5.457	5.467	5.440	5.453	5.447	5.437	5.457	5.447	5.427	5.423	5.437	5.453	5.437
MP5(μSv/h)	4.900	4.820	4.853	4.900	4.813	4.807	4.813	4.813	4.807	4.813	4.820	4.827	4.807	4.807	4.813	4.813	4.813	4.813	4.813	4.813	4.813	4.813	4.813	4.813
MP6(μSv/h)	6.070	6.060	6.057	6.063	6.063	6.047	6.050	6.047	6.033	6.023	6.037	6.033	6.060	6.023	6.003	6.033	6.030	6.033	6.020	6.023	6.053	6.027	6.010	6.047
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	SE	S	S	SSW	SSW	SSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	WSW	WSW	WSW	W	W	WNW
wind speed (m/s)	1.4	2.0	1.4	1.6	1.6	1.5	2.1	2.2	2.6	3.4	4.0	2.8	3.6	1.3	1.9	2.0	1.0	1.0	0.9	1.9	2.9	3.0	4.7	4.7

March 31, 2011																								
monitoring point	8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
MP1(μSv/h)	7.517	7.530	7.540	7.537	7.530	7.513	7.510	7.500	7.527	7.497	7.540	7.503	7.487	7.493	7.513	7.517	7.563	7.580	7.507	7.543	7.590	7.493	7.503	7.503
MP2(μSv/h)	3.983	3.993	3.970	3.990	3.970	3.953	3.963	3.967	3.973	3.963	3.963	3.980	3.970	3.960	3.973	4.003	4.050	4.023	3.993	3.977	4.023	3.983	3.960	3.983
MP3(μSv/h)	7.000	7.010	7.000	7.013	6.973	6.997	7.003	7.010	6.987	6.983	6.980	6.973	6.993	7.000	7.003	6.983	7.010	7.030	7.000	7.003	7.050	6.990	6.980	6.947
MP4(μSv/h)	5.427	5.410	5.423	5.427	5.433	5.440	5.397	5.440	5.430	5.413	5.433	5.410	5.423	5.403	5.410	5.417	5.453	5.470	5.417	5.413	5.443	5.413	5.403	5.423
MP5(μSv/h)	4.813	4.807	4.813	4.807	4.807	4.807	4.807	4.760	4.807	4.813	4.813	4.813	4.813	4.813	4.813	4.813	4.813	4.813	4.813	4.807	4.813	4.807	4.813	4.767
MP6(μSv/h)	6.020	6.007	6.040	6.043	6.027	6.010	6.003	6.027	6.020	6.013	6.020	6.017	6.000	6.023	6.003	6.063	6.067	6.050	6.070	6.047	6.060	6.027	6.017	6.030
MP7(μSv/h)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
wind direction	W	WNW	WNW	NNW	N	NNW	NNW	NNW	NNW	N	N	NNE	NNE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	E	SSW
wind speed (m/s)	3.5	2.3	4.4	4.5	5.8	5.2	5.2	4.7	2.5	2.5	3.0	2.7	2.5	3.0	3.0	3.1	4.1	4.2	5.4	5.0	5.0	5.9	6.1	1.7

Fukushima Dai-ni NPS

as of 17:00, April 1st, 2011

Location of Monitoring Post

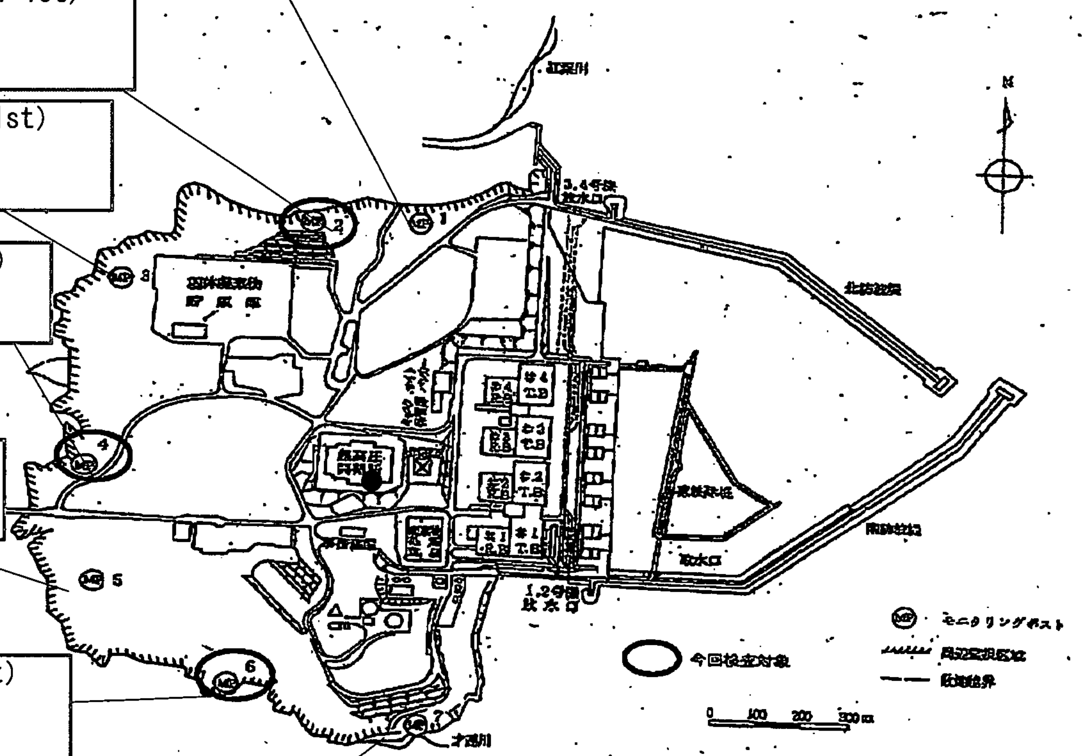
MP1 : 6.997 μSv/h (as of 15:30 April 1st)
(Ref. Value:0.035～0.054 μSv/h)

MP2 : 3.713 μSv/h (as of 15:30 April 1st)
(Ref. Value:0.042～0.062 μSv/h)

MP3 : 6.423 μSv/h (as of 15:30 April 1st)
(Ref. Valur:0.036～0.052 μSv/h)

MP4 : 4.660 μv/h (as of 15:30 April 1st)
(Ref. value: 0.036～0.052 μSv/h)

MP5 : 4.420 μSv/h (as of 15:30 April 1st)
(Ref. Value:0.041～0.058 μSv/h)



MP6 : 5.690 μSv/h (as of 15:30 April 1st)
(Ref. value:0.044～0.063 μSv/h)

MP7 : 3.250 μSv/h (as of 12:00 March 31th)
(Ref. Value: 0.043～0.062 μSv/h)

Results of envirinmental monitoring at each NPSs etc.

unit: μ Sv/h

Range of normal average value	Company	NPS	March 31, 2011											
			12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
0.023～0.027	Hokkaido Electric Power Co.	Tomari NPS	0.025	0.025	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026
0.024～0.060	Tohoku Electric Power Co.	Onagawa NPS	0.55	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.53	0.53	0.53	0.53
0.012～0.060		Higashidori NPS	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.016	0.017	0.017	0.017	0.017
0.033～0.050	Tokyo Electric Power Co.	Fukushima Dai-ichi※	98.9	97.7	99.9	96.5	107.0	97.7	97.0	96.3	96.2	95.7	95.2	94.8
0.036～0.052		Fukushima Dai-ni	6.977	6.957	6.943	6.907	6.900	6.900	6.940	6.847	6.810	6.793	6.747	6.733
0.011～0.159		Kashiwazaki kariwa NPS	0.065	0.064	0.064	0.065	0.065	0.065	0.066	0.065	0.066	0.066	0.065	0.066
0.036～0.053	Japan Atomic Power Co.	Tokai Dai-ni NPS	0.603	0.603	0.600	0.599	0.599	0.598	0.591	0.594	0.587	0.592	0.584	0.587
0.039～0.110		Tsuruga NPS	0.074	0.075	0.074	0.073	0.074	0.072	0.074	0.074	0.073	0.074	0.074	0.075
0.064～0.108	Chubu Electric Power Co.	Hamaoka NPS	0.075	0.075	0.075	0.075	0.075	0.074	0.074	0.074	0.074	0.075	0.075	0.075
0.0207～0.132	Hokuriku Electric Power Co.	Shika NPS	0.034	0.034	0.034	0.033	0.033	0.033	0.033	0.032	0.033	0.033	0.033	0.033
0.028～0.130	Chugoku Electric Power Co.	Shimane NPS	0.030	0.029	0.029	0.031	0.030	0.032	0.030	0.030	0.030	0.031	0.030	0.030
0.070～0.077	Kansai Electric Power Co.	Mihama NPS	0.071	0.072	0.072	0.072	0.072	0.073	0.073	0.073	0.073	0.073	0.073	0.074
0.045～0.047		Takahama NPS	0.043	0.043	0.043	0.044	0.043	0.043	0.042	0.043	0.042	0.043	0.043	0.042
0.036～0.040		Ooi NPS	0.036	0.035	0.036	0.035	0.034	0.034	0.035	0.035	0.035	0.035	0.035	0.035
0.011～0.080	Shikoku Electeic Power Co.	Ikata NPS	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.013	0.014	0.014	0.014
0.023～0.087	Kyushu Electric Power Co.	Genkai NPS	0.026	0.027	0.026	0.026	0.027	0.026	0.025	0.028	0.027	0.025	0.026	0.026
0.034～0.120		Sendai NPS	0.036	0.037	0.037	0.036	0.038	0.036	0.037	0.037	0.037	0.038	0.038	0.038
0.009～0.069	Japan Nuclear Fuel Limited	Japan Nuclear Fuel Reprocessing Plant	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.015	0.017	0.016	0.016	0.016
0.009～0.071		Japan Nuclear Fuel Plant Disposal	0.022	0.022	0.022	0.021	0.022	0.022	0.022	0.022	0.022	0.021	0.021	0.022

※There could be small deviation on the monitoring time and area because of operational situation concerning with data of Fukushima Dai-ichi NPS

Range of normal average value	Company	NPS	April 1, 2011											
			0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00
0.023～0.027	Hokkaido Electric Power Co.	Tomari NPS	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.027	0.026		
0.024～0.060	Tohoku Electric Power Co.	Onagawa NPS	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.51		
0.012～0.060		Higashidori NPS	0.016	0.017	0.016	0.017	0.018	0.018	0.017	0.018	0.017	0.017		
0.033～0.050	Tokyo Electric Power Co.	Fukushima Dai-ichi※	94.3	93.9	93.7	93.3	93.1	92.8	92.3	92.3	97.6	94.5		
0.036～0.052		Fukushima Dai-ni	6.730	6.710	6.697	6.670	6.633	6.620	6.610	6.567	6.657	6.567		
0.011～0.159		Kashiwazaki kariwa NPS	0.064	0.066	0.065	0.065	0.066	0.065	0.065	0.065	0.066	0.065		
0.036～0.053	Japan Atomic Power Co.	Tokai Dai-ni NPS	0.583	0.584	0.579	0.581	0.582	0.577	0.588	0.581	0.579	0.579		
0.039～0.110		Tsuruga NPS	0.074	0.075	0.074	0.074	0.074	0.075	0.074	0.075	0.072	0.075		
0.064～0.108	Chubu Electric Power Co.	Hamaoka NPS	0.075	0.075	0.075	0.075	0.075	0.076	0.075	0.075	0.075	0.075		
0.0207～0.132	Hokuriku Electric Power Co.	Shika NPS	0.033	0.032	0.033	0.033	0.033	0.033	0.033	0.033	0.034	0.033		
0.028～0.130	Chugoku Electric Power Co.	Shimane NPS	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.032		
0.070～0.077	Kansai Electric Power Co.	Mihama NPS	0.075	0.074	0.074	0.074	0.073	0.074	0.074	0.074	0.072	0.074		
0.045～0.047		Takahama NPS	0.043	0.042	0.043	0.043	0.042	0.043	0.043	0.042	0.043	0.043		
0.036～0.040		Ooi NPS	0.036	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.036		
0.011～0.080	Shikoku Electeic Power Co.	Ikata NPS	0.014	0.013	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.015		
0.023～0.087	Kyushu Electric Power Co.	Genkai NPS	0.026	0.026	0.027	0.027	0.027	0.026	0.026	0.027	0.025	0.027		
0.034～0.120		Sendai NPS	0.036	0.040	0.035	0.039	0.039	0.039	0.038	0.036	0.039	0.041		
0.009～0.069	Japan Nuclear Fuel Limited	Japan Nuclear Fuel Reprocessing Plant	0.016	0.017	0.016	0.017	0.016	0.017	0.017	0.017	0.017	0.017		
0.009～0.071		Japan Nuclear Fuel Plant Disposal	0.022	0.022	0.022	0.022	0.023	0.023	0.023	0.022	0.023	0.023		

※There could be small deviation on the monitoring time and area because of operational situation concerning with data of Fukushima Dai-ichi NPS

From: ET02 Hoc
Sent: Friday, March 18, 2011 8:32 PM
To: RST01 Hoc
Subject: RE: look at blast video again

This is unit 1, much smaller blast: http://www.youtube.com/watch?v=x4-LofPS6FA

From: RST01 Hoc
Sent: Friday, March 18, 2011 8:08 PM
To: ET02 Hoc
Subject: RE: look at blast video again

Anything we are to be making note of?

From: ET02 Hoc
Sent: Friday, March 18, 2011 8:03 PM
To: RST01 Hoc
Subject: look at blast video again

http://www.youtube.com/watch?v=SeSTqI-wqQY

QQQ 3/12

From: Hoc, PMT12
Sent: Friday, April 01, 2011 7:41 AM
To: Blount, Tom
Cc: ET07 Hoc
Subject: Commission/ Chairmen Update
Attachments: Major dose assessment matrix_03312011.xlsx; 2011 04-01 Re-entry criteria Task 3108 (2) (3).doc

000213

- **U.S. Citizens in Japan: Thresholds and Planning**

  - Based on what we know at the current time the NRC would not recommend relaxing the 50 mi protective action recommendation and no additional protective actions are necessary at this time.

  - CRITERIA FOR A RECOMMENDATION TO RELAX 50 MILE EXCLUSION ZONE:
    - Radioactivity releases have been terminated and the source of the radioactivity release is under control.
    - The decision to allow public re-entry would be based on field measurements and samples obtained from the affected area once the above criteria are satisfied.
    - A Re-entry recommendation would not generally be supported as long as the projected dose in the first year exceeds 2 rem, or exceeds 0.5 rem in the second year, or exceeds 5 rem in 50 years, depending on which case is most limiting.

  - **DOD Requests for Protective Action Trip Points**

    - NRC has received multiple requests to base protective action recommendations on aggregate dose rates or airborne concentration. However, this is not possible since NRC would recommend protection actions based on the total effective dose equivalent, including consideration of internal and external doses, distribution of nuclides, and meteorological conditions. That information is scenario specific and not available for development of a specific dose rate or concentration.

- **Plume Modeling**
  - The NRC has provided updated "Pessimistic Source Term for US Embassy" source term information to NARAC.
  - The environmental monitoring data detected in the United States is not unexpected or harmful.

- **Government of Japan: Requests for Technical Assistance**

  - It is important that a coordinated US response is provided to Japan.

  - NRC's team in Japan has been working with the U.S. Ambassador and a government-industry consortium to coordinate requests for materials, equipment and expertise. The U.S. Embassy may assume lead role in communicating to IAEA all U.S. assistance to Japan and coordinating that assistance if DOS-HQ is agreeable.
  - An outstanding issue continues to be who pays.
  - Success is that the Japanese regulator is viewed as capable and a respected regulator.

- **Domestic Preparedness**

  - NRC continues to participate in coordination phone calls with other Federal Agencies (EPA/DHS/HHS/CDC, etc.) to ensure that resources are made

available to assist as necessary and a consistent message is communicated by NRC. NRC continues to support DOE development of dose assumptions in U.S. Territories.
  - There is no reduction in NRC preparedness to deal with any nuclear power plant potential emergency in our own Nation.
  - This event has prompted reevaluation of our own emergency preparedness.
  - It is important not to rush to judgment and to take a measured approach in the reevaluation process.

- **Temporary Radiological Standards for International Cargo**

  - There was general agreement at a March 31 IPC meeting that packages with surface contamination below 0.4 Bq/cm^2 can be released into general commerce and that packages with surface contamination above 4 Bq/cm^2 should not be released into general commerce.

  - For packages with surface contamination between 0.4 Bq/cm^2 and 4 Bq/cm^2

    - DOT favored that packages with surface contamination between 0.4 Bq/cm^2 and 4 Bq/cm^2 be labeled and transported as radioactive hazardous material. NRC requirements and IAEA standard support adherence to DOT's position.

    - Most of the other agencies appeared to favor allowing unrestricted shipment up to 4.0 Bq/cm^2

    - The 4 Bq/cm^2 limit was established for beta and gamma emitters and low toxicity alpha emitters. The 0.4 Bq/cm^2 was established for all other alpha emitters.

    - The health and safety significance of the difference is likely small, but un-assessed. However, it may prove difficult to explain to the public why the US government deviated from the established requirements.

  - We see no basis to deviate from our current framework from a health and safety perspective.

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Friday, April 01, 2011 3:29 PM
To: ET07 Hoc
Cc: LIA02 Hoc; LIA01 Hoc; Kozal, Jason; Dudek, Michael
Subject: RE: Night Shift at USAID

For the next 45 minutes, I (Joe Anderson) am here at USAID. No one will be at USAID this evening. Mike Dudek is on call, and plans to be at USAID for 4-5 hours Saturday and Sunday. USAID will NOT be staffing RMT after 7 pm and is at reduced staffing levels currently today.

From: ET07 Hoc [mailto:ET07.Hoc@nrc.gov]
Sent: Friday, April 01, 2011 2:19 PM
To: RMTPACTSU_ELNRC
Subject: RE: Night Shift at USAID

Who's on at USAID today for NRC?

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Thursday, March 31, 2011 11:00 PM
To: LIA01 Hoc; LIA02 Hoc; LIA11 Hoc; LIA08 Hoc; LIA07 Hoc; LIA12 Hoc; LIA04 Hoc; LIA03 Hoc; LIA06 Hoc; RST01 Hoc; PMT01 Hoc; Hoc, PMT12; PMT09 Hoc; ET07 Hoc
Cc: Kozal, Jason; Dudek, Michael; Anderson, Joseph; Marshall, Jane; Gott, William; Grant, Jeffery
Subject: Night Shift at USAID

All,

Tonight will be the last night that night shift is staffed at USAID. Starting tomorrow (Friday), normal staffing hours for the NRC rep here at USAID will be 7am to 7pm. After hours communications and requests should be emailed to the NRC email account here (rmtpactsu_elnrc@ofda.gov). After hours emergencies should be directed to the LT Federal Liaison who will direct the request to someone on call. If you have any questions, please contact Jason Kozal at Jason.kozal@nrc.gov. Thank you,

Jeff Kowalczik
NRC Liaison to USAID

2014

From: Foster, Jack
Sent: Friday, April 01, 2011 6:31 AM
To: LIA03 Hoc; Ali, Syed; Bernhard, Rudolph; Blamey, Alan; Call, Michel; Casto, Chuck; Collins, Elmo; Cook, William; Devercelly, Richard; Dorman, Dan; Emche, Danielle; Foggie, Kirk; Foster, Jack; Giessner, John; Hay, Michael; Holahan, Vincent; Jackson, Todd; Kolb, Timothy; Miller, Marie; Monninger, John; Nakanishi, Tony; Ramsey, Jack; Salay, Michael; Scott, Michael; Sheikh, Abdul; Smith, Brooke; Stahl, Eric; Taylor, Robert; Trapp, James; Ulses, Anthony; Way, Ralph
Cc: LIA02 Hoc
Subject: RE: Notification of your arrival in the U.S.
Attachments: image001.gif

I'm back ...3/27/11

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment
Jack Foster, Chief
Licensing Branch
FSME/DMSSA/LISD/LB - MS T -8-F18
U.S Nuclear Regulatory Commission
Washington, DC 20555
(301) 415-6250

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

000/215

From: Nakanishi, Tony
Sent: Friday, April 01, 2011 6:04 PM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: Re: Notification of your arrival in the U.S.

I'm back in the US.

From: LIA03 Hoc
To: Liaison Japan
Cc: LIA02 Hoc
Sent: Thu Mar 31 19:10:09 2011
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Dorman, Dan
Sent: Sunday, April 03, 2011 3:18 PM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: Re: Notification of your arrival in the U.S.

I'm back.

From: LIA03 Hoc
To: Liaison Japan
Cc: LIA02 Hoc
Sent: Thu Mar 31 19:10:09 2011
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Cook, William
Sent: Monday, April 04, 2011 5:08 PM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: RE: Notification of your arrival in the U.S.

Follow Up Flag: Follow up
Flag Status: Flagged

All,
I returned safely to U.S. (Phila Airport) 2100 EST, on 4/1. I am back in the Region I office today 4/4.
Regards,
Bill Cook

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Sheikh, Abdul
Sent: Monday, April 04, 2011 6:08 PM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: Re: Notification of your arrival in the U.S.

Follow Up Flag: Follow up
Flag Status: Flagged

I arrived home in washington DC at 530 PM EST on April 4, 2011.
Abdul Sheikh

From: LIA03 Hoc
To: Liaison Japan
Cc: LIA02 Hoc
Sent: Thu Mar 31 19:10:09 2011
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Ali, Syed
Sent: Monday, April 04, 2011 8:19 PM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: RE: Notification of your arrival in the U.S.

Follow Up Flag: Follow up
Flag Status: Flagged

I have arrived home.

Syed Ali

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Jackson, Todd
Sent: Wednesday, April 06, 2011 5:36 PM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: Re: Notification of your arrival in the U.S.

Arrived Phil 530 pm 4/6 EDT.
Todd

From: Monninger, John
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Sent: Tue Apr 05 19:37:21 2011
Subject: RE: Notification of your arrival in the U.S.

I arrived back in the U.S. about 3:30 pm EDT on Tuesday, 4/5/11.

John Monninger

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Giessner, John
Sent: Thursday, April 07, 2011 5:10 PM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: Re: Notification of your arrival in the U.S.

I have arrived in Chicago (4PM cdt).
Jack
(Sent from Blackberry)

From: Scott, Michael
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Sent: Wed Apr 06 20:10:10 2011
Subject: RE: Notification of your arrival in the U.S.

I arrived U.S. 3:37 pm EDT 4/6/11.

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Miller, Marie
Sent: Saturday, April 09, 2011 11:58 PM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: Re: Notification of your arrival in the U.S.

Marie Miller back in the USA
Sent by BlackBerry

From: LIA03 Hoc
To: Liaison Japan
Cc: LIA02 Hoc
Sent: Thu Mar 31 19:10:09 2011
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Bernhard, Rudolph
Sent: Sunday, April 17, 2011 5:35 AM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: RE: Notification of your arrival in the U.S.

Rudy arrived back in Atlanta about 14 hours ago. (1530 Saturday, Atlanta time)

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Blamey, Alan
Sent: Sunday, April 17, 2011 7:30 AM
To: LIA03 Hoc; Liaison Japan
Cc: LIA02 Hoc
Subject: RE: Notification of your arrival in the U.S.

Alan Blamey made is back to the US safely on Saturday.

From: LIA03 Hoc
Sent: Thursday, March 31, 2011 7:10 PM
To: Liaison Japan
Cc: LIA02 Hoc
Subject: Notification of your arrival in the U.S.

Dear NRC Japan Team - Upon your return, please "reply All" to this email and let the International Liaison Team know that you're back in the U.S.

Thank you in advance.
Mugeh
On behalf of the International Liaison Team

From: Alter, Peter
Sent: Friday, April 01, 2011 7:11 AM
To: RST Communicator; RST01 Hoc
Subject: FW: conversion rates - why doesn't the IRC make these updates - more user friendly i.e. convert °C to °F

Follow Up Flag: Follow up
Flag Status: Flagged

Something for the communicators to think about.

From: Thorp, John
Sent: Wednesday, March 30, 2011 9:48 AM
To: Hasselberg, Rick; Alter, Peter
Cc: King, Mark
Subject: FW: conversion rates - why doesn't the IRC make these updates - more user friendly i.e. convert °C to °F

Rick/Peter,

Maybe we can have this be something the communicators & coordinators think about as we put together our status reports, to show both Metric and U.S. units (e.g. C and F for temperatures).

This could save a lot of staff (and other stakeholders) from having to take the time to do the conversion themselves, an overall efficiency positive.

Thanks,

John

From: King, Mark
Sent: Wednesday, March 30, 2011 8:15 AM
To: Thorp, John; Brown, Michael
Subject: RE: conversion rates - why doesn't the IRC make these updates - more user friendly i.e. convert °C to °F

The IRC can use this webpage link
http://www.metric-conversions.org/temperature/celsius-to-fahrenheit.htm
(it also provides links for other metric conversions]
Example - I did it for instance in today's status report - see attached/ and the info pasted below:

STATUS as of 0430 EDT, March 30, 2011 (1730 Japan, March 30)
Unit 1 – (NRC Priority: 1)
Core Status: Damaged, fuel partially or fully exposed (Source: JAIF, NISA, TEPCO).
The volume of sea water injected to cool the core has left enough salt to fill the lower plenum to the core plate (Source: GEH, US Industry).
Vessel temperatures 138°C **[280.4°F]** at bottom drain, 309°C **[588.2°F]** at FW nozzle (Source: NISA-3/29) 138=
RPV at 60.5 psig (Source: JAIF 3/29), DW and torus pressure at 26.6 psig (Source: NISA 3/29).
Unit 2 – (NRC Priority: 2)
Core Status: Damaged, fuel partially or fully exposed (Source: JAIF, NISA, TEPCO).

0001 | 216

Bottom head temperature 120° C, **[248°F]** feed water nozzle temperature 153.7°C **[308.66° F]** (Source: NISA). RVP pressure -3.9 psig (Source: JAIF 3/29). DW pressure 0 psig (Source: NISA 3/29).
Spent Fuel Pool: Fuel covered, freshwater periodically injected via fuel pool cooling system (Source: TEPCO 3/29), fuel pool temperature 46°C **[114.8° F]**(Source: NISA 3/29); Pool may be overflowing based on observations of water in adjacent areas (Source: NRC Team); white smoke being emitted as of 1830 EDT on March 27 (Source: IAEA 3/28) – confirmed (Source: TEPCO 3/29)
Unit 3 – (NRC Priority: 3)
Core Status: Damaged, fuel partially or fully exposed (Source: JAIF, NISA, TEPCO).
Bottom head temperature 121°C **[249.8 °F],** FW nozzle temperature: 62°C **[143.6°F]** (Source: NISA 3/29).
RVP pressure -3.7 psig (Source: JAIF 3/29). RPV level ~2/3 TAF (Source: IAEA 3/28).
DW pressure 0.97 psig (Source: IAEA 3/28).
Unit 5 – (NRC Priority: 5)
Core Status: In vessel (Source: JAIF, NISA, TEPCO), temperature 35°C **[95°F]** (Source: JAIF 3/29)

Just a thought for the IRC's consideration.
Mark

From: King, Mark
Sent: Wednesday, March 30, 2011 7:12 AM
To: Brown, Michael
Subject: RE: a radiation dose chart - in sieverts that I ran across

Thanks for the conversion link -
Isn't it just divide by 10 the # of micro-sieverts and you get mrem OR multiply the micro-sieverts by 10 and you get rem. It really is a pretty easy conversion. I don't know why the US doesn't convert and use them and why we don't go metric!!??!! … the US and Burma are the only two countries left in the world on the old English measurement system. – And…you usually don't want your country to be singled out with the country of Burma (Myanmar) these days --- which is ruled by a brutal military junta. (Hey come to think of it we may be a lot like them than I like to admit … fire your weapons first… think about the consequences / ramifications second).

…Anyway…I just like that other chart because it gave you several real life data points that people can relate to like – airplane trip from NY to LA gives you ~ 40 uSV = ~ 4 mrem. And nobody worries about taking a coast-to-coast airplane trip - (at least not because of the radiation dose).

From: Brown, Michael
Sent: Tuesday, March 29, 2011 5:41 PM
To: King, Mark; Garry, Steven
Cc: Conatser, Richard; Giantelli, Joseph; Thorp, John
Subject: RE: a radiation dose chart - in sieverts that I ran across

Here's one I use

http://hptech.org/nuclear/convert/sievert.html

Although after awhile you realize that 1 rem = 10 m Sv, it's not that tough a conversion.

I still get confused with micro sieverts though.

Mike

From: King, Mark
Sent: Tuesday, March 29, 2011 5:09 PM
To: Garry, Steven
Cc: Conatser, Richard; Giantelli, Joseph; Brown, Michael; Thorp, John
Subject: FW: a radiation dose chart - in sieverts that I ran across

---

Subject: a radiation dose chart in sieverts that I ran across

SEE LINK - **http://xkcd.com/radiation/**

Note this prints out very small... easier to see on your computer
Use view zoom as necessary.
Just an FYI
Mark

From: RST01 Hoc
Sent: Friday, April 01, 2011 2:16 PM
To: RST01 Hoc
Cc: RMTPACTSU_ELNRC
Subject: E-mail Addresses to include on Assessments

Follow Up Flag: Follow up
Flag Status: Flagged

BMPC_ECC.Contractor@unnpp.gov

RMTPACTSU_ELNRC@ofda.gov

0000217

From: Marksberry, Don
Sent: Wednesday, April 06, 2011 10:04 AM
To: RST01 Hoc; Thorp, John; Tinkler, Charles; Schaperow, Jason; Arndt, Steven; Esmaili, Hossein; Helton, Donald
Cc: Lee, Richard; Demoss, Gary; Coyne, Kevin
Subject: Plant Status Chronologies of Units 1, 2, and 3
Attachments: Fukushima Daiichi Chronology (04-06-2011).xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Here is this morning's edition of plant status chronology and data tables for Units 1, 2, and 3 that we are maintaining informally in RES. It does not include radiological information. The data tables were second checked last night.

Please note that the info sources are official press releases from TEPCO and NISA. No other sources or speculations were included.

I understand that John Thorp et al. is developing a timeline and will forward it to the RST before it is sent to the Site Team.

Please let me know what we can do to help.

Don

Plant Parameters: **Unit 3**															
Revision 4/06/2011															
Source: NISA Press Releases	Unit	3/14	3/15	3/16	3/17	3/17	3/18	3/18	3/18	3/19	3/19	3/19	3/20	3/20	3/20
		19:30	11:42	12:40	3:20	11:10	2:45	12:35	21:05	6:10	11:15	17:25	4:30	11:00	16:00
RPV Injection															
via Feed Water Line	L/min														
via Fire Extinguishing Line	L/min														
via Fire Extinguishing Line	m3/h														
RPV Level															
Fuel Range A	mm	-1900	-1900	-1900	-1950	-1950	-2000	-2000	-1900	-1200	-1950	-1850	-1950	-1950	-1650
Fuel Range B	mm	-2300	-2300	-2300	-2300	-2300	-2300	-2300	-2300	-2300	-2300	-2300	-2300	2350	-2000
RRV Pressure (see note)		Note: 1	Note: 1	Note: 1	Note: 1	Note: 1									
Channel A	MPa g	0.183	0.244	0.059	0.023	0.014	-0.005	-0.018	-0.016	0.045					
Channel B	MPa g	0.183	0.244	0.065	0.032	0.023	0.014	0.000	0.016	0.005	-0.023	0.086	0.216	0.189	0.162
Channel C	MPa g										-0.023	-0.050	0.180	0.149	0.119
Channel A	MPa abs	0.284	0.345	0.160	0.124	0.115	0.096	0.083	0.085	0.146					
Channel B	MPa abs	0.284	0.345	0.166	0.133	0.124	0.115	0.101	0.117	0.106	0.078	0.187	0.317	0.290	0.263
Channel C	MPa abs										0.078	0.051	0.281	0.250	0.220
Drywell Pressure	MPa abs	335	415	230	200	190	0.155	0.155	0.160	0.185	0.160	0.210	0.340	0.310	0.290
Suppression Chamber Pressure	MPa abs	500	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	Note 1	Note 2	Note 3
RPV Temperature		Note 1: Both readings are noted in the press releases as coming from channel A											Note 1: "Down scale 100"		
Feedwater Nozzle Temp	C													Note 2: "400 overs	
RPV Bottom Head Temp	C														Note 3: "8
Containment Atm Monitoring System															
Drywell	Sv/h														
Suppression Chamber	Sv/h														
Notes:															
NISA News releases started reported gage pressure, then converted readings to absolute pressure. NISA separate parameter tables report gage pressure. Conversion in this table in BLUE.															
Standard atmospheric pressure = 101.325 kPa = 0.101325 Mpa Absolute pressure = 0.101325 MPa + 0.06 MPa = 0.161325 Mpa															

3/21	3/21	3/21	3/22	3/22	3/23	3/23	3/24	3/24	3/24	3/25	3/25	3/25	3/25	3/26	3/26	3/26	3/26	3/26	3/27
4:00	12:15	14:55	5:30	10:35	4:00	9:10	2:40	10:20	18:00	6:10	16:10	18:02	20:05	5:05	7:00	10:00	11:15	18:00	4:45
												Start Freshwater							
							Failed	Failed	Failed			240	240		230			220	
													Note 5						
-1650	-1600	-1550	-1575	-1575	-1900	-1800	-1800	-1900	-1850	-1900	-1900			-1850		-1800	-1850		-1850
-1950	-2000	-2025	-2350	-2350	-2300	-2300	-2300	-2300	-2300	-2300	-2300			-2300		-2300	-2300		-2300
0.214	0.043	0.045	0.038	0.036	0.036	0.034	0.041	0.036	0.038	0.038	0.036			0.038		0.038	0.038		0.029
-0.027	-0.083	-0.088	-0.101	-0.101	-0.101	-0.104	-0.097	-0.099	-0.101	-0.097	-0.099			-0.101		-0.101	-0.101		-0.099
0.315	0.144	0.146	0.139	0.137	0.137	0.135	0.142	0.137	0.139	0.139	0.137			0.139		0.139	0.139		0.130
0.074	0.018	0.013	0.000	0.000	0.000	-0.003	0.004	0.002	0.000	0.004	0.002			0.000		0.000	0.000		0.002
0.160	0.120	0.110	0.100	0.100	0.100	0.100	d/s	0.107	0.107	0.1074	0.1075			0.1069		0.1066	0.1068		0.1073
dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	dwn/scale	0.199	0.2	0.1937	0.1895			0.1848		0.1839	0.1836		0.1804
							Note 4,6	Note 6	Note 6	Note 6	Note 6			Note 6		Note 6	Note 6		Note 6
ale"							80.7	14.1	65.6	42.8	-33.4			26.1		37.6	33.7		-1.7
00 down scale"							185.4	185.5	155.7	111.6	111			102.5		106.1	100.4		106.8
							57.9	55.9	53.3	51	38.8			36.6		36.1	36.1		34.2
							1.66	1.62	1.45	1.5	1.31			1.41		1.4	1.4		1.34
							Note 4: Time of temperatures 2:20						Note 5: 240 to 250 l/hr			Note 6: Feedwater nozzle temperature			

3/27	3/27	3/28	3/28	3/28	3/29	3/29	3/29	3/30	3/30	3/31	3/31	4/1	4/1	4/2	4/2	4/3	4/3	4/3	4/3
10:10	14:00	5:30	10:30	20:32	4:45	12:00	14:39	3:50	13:30	4:40	9:40	5:45	11:45	1:30	12:10	2:30	10:30	12:18	17:32
	210			200			116												
																		8.0	7.0
-1900		-1900	-1850		-1900	-1850		-1850	-1850	-1900	-1850	-1900	-1900	-1850	-1850	-1850	-1850		
-2300		-2300	-2250		-2300	-2250		-2250	-2250	-2300	-2250	-2250	-2250	-2250	-2250	-2250	-2250		
0.032		0.029	0.025		0.034	0.029		0.023	0.018	0.02	0.016	0.018	0.016	0.025	0.014	0.011	0.011		
-0.099		-0.090	-0.095		-0.090	-0.095		-0.092	-0.095	-0.09	-0.092	-0.086	-0.088	-0.086	-0.095	-0.088	-0.083		
0.133		0.130	0.126		0.135	0.130		0.124	0.119	0.121	0.117	0.119	0.117	0.126	0.115	0.112	0.112		
0.002		0.011	0.006		0.011	0.006		0.009	0.006	0.011	0.009	0.015	0.013	0.015	0.006	0.013	0.101		
0.1076		0.1083	0.1076		0.1085	0.1075		0.1071	0.1064	0.1073	0.1066	0.1071	0.1068	0.1055	0.1050	0.1061	0.1062		
0.1806		0.1794	0.1792		0.1792	0.1796		0.1780	0.1775	0.1764	0.1755	0.1755	0.1757	0.1748	0.1748	0.1748	0.1750		
Note 6		Note 6			Note 6	Note 6			Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	Note 6		
13.6		38			61.5	62.2		75.3	76.7	88.5	88.6	92.6	90.2	90.8	92.3	90.6	90.6		
121.6		123			120.9	121.1		116	115.4	114.2	114.4	116.3	117.8	119.4	117.8	115.9	114.3		
33.7		31.5			29.2	28.6		27.6	26.8	25.7	25.4	24.5	24.2	24	23.2	22.2	21.7		
1.31		1.24			1.18	1.16		1.11	1.09	1.05	1.04	1.00	0.98	0.955	0.935	0.911	0.897		
reading under survey																			

4/4	4/4						
3:30	9:30						
-1800	-1800						
-2250	-2250						
0.007	0.005						
-0.081	-0.083						
0.108	0.106	0.101	0.101	0.101	0.101	0.101	0.101
0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101
0.1073	0.1069						
0.1754	0.1757						
Note 6	Note 6						
89.8	90.0						
114.1	113.7						
21.5	21.1						
0.871	0.864						

From: Stahl, Eric
Sent: Friday, April 01, 2011 7:24 PM
To: LIA02 Hoc; LIA03 Hoc
Cc: Emche, Danielle
Subject: FW: CORRECTION: Ticket reservations
Attachments: image001.png

Importance: High

FYI

From: Johnson, Natalya [mailto:njohnson@ofda.gov]
Sent: Friday, April 01, 2011 6:02 AM
To: usaidtravel@duluthtravel.com; USAID Travel
Cc: Stahl, Eric; travel; RMTPACTSU_AC
Subject: CORRECTION: Ticket reservations
Importance: High

Good morning,

Few corrections to the list below (please see in red) sent earlier today:

1. Ralph Way – leave from Narita, Japan back to US on **April 4,** 2011
2. Syed Ali – leave from Narita, Japan back to US on **April 4,** 2011
3. Abdul Sheikh – leave from Narita, Japan back to US on **April 4,** 2011
4. Alan Blamey – leave from Narita, Japan back to US on April 6, 2011
5. Michael Scott – leave from Narita, Japan back to US on April 6, 2011
6. Todd Jackson – leave from Narita, Japan back to US on April 6, 2011
7. Natalya Johnson – leave from Narita, Japan back to US on April 7, 2011
8. John Monninger – leave from Narita, Japan back to US on April 7, 2011
9. Robert Taylor – leave from Narita, Japan back to US on April 7, 2011
10. Marie Miller – leave from Narita, Japan back to US on April 7, 2011
11. Jack Geissner – leave from Narita, Japan back to US on April 7, 2011
12. Eric Stahl – leave from Narita, Japan back to US on April 11, 2011
13. Danielle Emche – leave from Narita, Japan back to US on April 12, 2011

Please send ticket confirmations to each recipient, as well as to rmtpactsu_ac@ofda.gov, ofdatravel@ofda.gov, njohnson@ofda.gov

Thank you for your soonest response to this request.

Regards,
~Natalya

Admin Coordinator
Pacific Tsunami and Japan Earthquake DART
USAID/DCHA/OFDA
Office: (81) (3) 3224 5016

QQQ/218

BB: (1) 571 354 9086

From: Johnson, Natalya
Sent: Friday, April 01, 2011 11:31 AM
To: 'usaidtravel@duluthtravel.com'; 'USAID Travel'
Cc: eric.stahl@nrc.gov; travel
Subject: Ticket reservations
Importance: High

Greetings,

I am with USAID/OFDA Disaster Response Team in Tokyo, Japan, and need to make few flight reservations for some of our departing team members.

1. Alan Blamey – leave from Narita, Japan back to US on April 6, 2011
2. Michael Scott – leave from Narita, Japan back to US on April 6, 2011
3. Todd Jackson – leave from Narita, Japan back to US on April 6, 2011
4. Syed Ali – leave from Narita, Japan back to US on April 6, 2011
5. Natalya Johnson – leave from Narita, Japan back to US on April 7, 2011
6. John Monninger – leave from Narita, Japan back to US on April 7, 2011
7. Abdul Sheikh – leave from Narita, Japan back to US on April 7, 2011
8. Robert Taylor – leave from Narita, Japan back to US on April 7, 2011
9. Marie Miller – leave from Narita, Japan back to US on April 7, 2011
10. Ralph Way – leave from Narita, Japan back to US on April 7, 2011
11. Jack Geissner – leave from Narita, Japan back to US on April 7, 2011
12. Eric Stahl – leave from Narita, Japan back to US on April 11, 2011
13. Danielle Emche – leave from Narita, Japan back to US on April 12, 2011

Please send ticket confirmations to each recipient, rmtpactsu_ac@ofda.gov, ofdatravel@ofda.gov, njohnson@ofda.gov

Thank you for your soonest response to this request.

Regards,
~Natalya

Admin Coordinator
Pacific Tsunami and Japan Earthquake DART
USAID/DCHA/OFDA
Office: (81) (3) 3224 5016
BB: (1) 571 354 9086

From: Stone, Rebecca
Sent: Friday, April 01, 2011 12:10 AM
To: Kugler, Andrew
Cc: Fiske, Jonathan; Ralph, Melissa
Subject: RE: Correction: FOIA information request

Andrew,

I have been working nights in the Ops Center so I haven't been as involved in this FOIA as was originally expected. I am not sure of the answers to your questions but I have cc'ed two others who may have more information. I am sorry I couldn't be more helpful.

Best,
Rebecca

From: Kugler, Andrew
Sent: Thursday, March 31, 2011 11:58 AM
To: Stone, Rebecca
Subject: RE: Correction: FOIA information request

Rebecca

A couple of questions related to this FOIA:

1. Is there a cut-off date after which we stop sending the emails? Or is it open-ended? Usually there's a date range on a FOIA.

2. Through DSER we're being asked to respond to an apparently separate FOIA (2011-0147, from Greenpeace) with a date range of 3/11-3/24/11. The instructions say not to include documents already covered by the previous FOIA, 2011-0141. What is the number of the AP FOIA? Is it 0141? I'm not sure how many FOIAs on this subject are floating around.

Andy

From: Stone, Rebecca
Sent: Saturday, March 19, 2011 11:32 PM
To: Kugler, Andrew
Subject: RE: Correction: FOIA information request

Andy,

As far as I know, everything is being emailed and it will be sorted form there. So yes, please send that.

Thanks,
Rebecca

From: Kugler, Andrew
Sent: Saturday, March 19, 2011 4:22 PM

000219

To: Stone, Rebecca
Subject: RE: Correction: FOIA information request

Rebecca

The only emails I've received or sent were related to the watchbill for the Ops Center. Are we to include those?

Andy

From: OST01 HOC
Sent: Saturday, March 19, 2011 3:25 PM
To: Abrams, Charlotte; Adams, John; Afshar-Tous, Mugeh; Alemu, Bezakulu; Alter, Peter; Anderson, James; Ashkeboussi, Nima; Baker, Stephen; Bergman, Thomas; Berry, Rollie; Bloom, Steven; Blount, Tom; Boger, Bruce; Bower, Anthony; Brandon, Lou; Brandt, Philip; Brock, Kathryn; Brown, Cris; Brown, David; Brown, Eva; Brown, Frederick; Bukharin, Oleg; Camper, Larry; Carpenter, Cynthia; Case, Michael; Casto, Greg; Cervera, Margaret; Chazell, Russell; Chen, Yen-Ju; Chokshi, Nilesh; Chowdhury, Prosanta; Circle, Jeff; Clement, Richard; Clinton, Rebecca; Collins, Frank; Cool, Donald; Costa, Arlon; Crutchley, Mary Glenn; Cruz, Zahira; Dacus, Eugene; DeCicco, Joseph; Decker, David; Dembek, Stephen; Devlin, Stephanie; Doane, Margaret; Dorman, Dan; Dozier, Jerry; Droggitis, Spiros; Dudek, Michael; Dudes, Laura; Emche, Danielle; English, Lance; Erlanger, Craig; Esmaili, Hossein; Figueroa, Roberto; Fiske, Jonathan; Franovich, Rani; Fuller, Edward; Galletta, Thomas; Gambone, Kimberly; Giitter, Joseph; Gordon, Dennis; Gott, William; Grant, Jeffery; Grobe, Jack; Hale, Jerry; Hardesty, Duane; Hart, Ken; Hart, Michelle; Hasselberg, Rick; Henderson, Karen; Hiland, Patrick; Holahan, Patricia; Holahan, Vincent; Holian, Brian; Huyck, Doug; Howard, Tabitha; Huffert, Anthony; Hurd, Sapna; Isom, James; Jackson, Karen; Jessie, Janelle; Johnson, Michael; Jolicoeur, John; Jones, Andrea; Jones, Cynthia; Kahler, Carolyn; Kammerer, Annie; Karas, Rebecca; Khan, Omar; Kowalczik, Jeffrey; Kozal, Jason; Kratchman, Jessica; Kugler, Andrew; Lamb, Christopher; Larson, Emily; LaVie, Steve; Lewis, Robert; Li, Yong; Lombard, Mark; Lubinski, John; Lynch, Jeffery; Mamish, Nader; Manahan, Michelle; Marksberry, Don; Marshall, Jane; Mayros, Lauren; Mazaika, Michael; McConnell, Keith; McCoppin, Michael; McDermott, Brian; McGinty, Tim; McMurtray, Anthony; Merritt, Christina; Meyer, Karen; Miller, Charles; Miller, Chris; Milligan, Patricia; Mohseni, Aby; Moore, Scott; Morlang, Gary; Morris, Scott; Mroz (Sahm), Sara; Munson, Clifford; Murray, Charles; Nerret, Amanda; Norris, Michael; Norton, Charles; Ordaz, Vonna; Padovan, Mark; Patel, Jay; Parillo, John; Pope, Tia; Purdy, Gary; Quinlan, Kevin; Ragland, Robert; Ralph, Melissa; Reed, Elizabeth; Reed, Wendy; Reis, Terrence; Riley (OCA), Timothy; Rini, Brett; Rodriguez-Luccioni, Hector; Rosenberg, Stacey; Ross-Lee, MaryJane; Roundtree, Amy; Ruland, William; Salay, Michael; Salus, Amy; Sanfilippo, Nathan; Scarbrough, Thomas; Schaperow, Jason; Schmidt, Duane; Schoenebeck, Greg; Schrader, Eric; Schwartzman, Jennifer; Seber, Dogan; Shane, Raeann; Shea, James; Shepherd, Jill; Sheron, Brian; Skeen, David; Sloan, Scott; Smiroldo, Elizabeth; Smith, Theodore; Stahl, Eric; Stang, Annette; Steger (Tucci), Christine; Stieve, Alice; Stone, Rebecca; Stransky, Robert; Sturz, Fritz; Sullivan, Randy; Sun, Casper; Tappert, John; Temple, Jeffrey; Thaggard, Mark; Thomas, Eric; Thorp, John; Tobin, Jennifer; Trefethen, Jean; Tschiltz, Michael; Turtil, Richard; Uhle, Jennifer; Valencia, Sandra; Vaughn, James; Vick, Lawrence; Wastler, Sandra; Watson, Bruce; Weber, Michael; Webber, Robert; White, Bernard; Wiggins, Jim; Williams, Donna; Williams, Joseph; Williamson, Linda; Willis, Dori; Wimbush, Andrea; Wittick, Brian; Wray, John; Wright, Lisa (Gibney); Wright, Ned; Wunder, George; Young, Francis; Zimmerman, Roy
Subject: Correction: FOIA information request

Good Afternoon All,

The staff of the NRC HOC has received a broad scope FOIA request from the Associated Press requiring the release of all communications pertaining to the Japanese nuclear incidents caused by the March 11, 2011, earthquake and tsunami.

In response to this request, an email account is being created as a FOIA drop box. In the near future, you will be required to forward all emails that you have received (either to your personal email or HOC computer email) relating to these events to the established drop box. This includes emails that you have deleted but have the ability to restore. In addition, all future emails pertaining to the Japanese nuclear incidents MUST be copied to this drop box. The address is FOIA Response.hoc Resource@nrc.gov or FoiaResponse.hoc@nrc.gov.

A team is currently being assembled to ensure that all forwarded communications will be reviewed, and any information that qualifies for exemption (including P.I.I.) will be redacted. Therefore, you do not need to filter or redact any communication that is to be forwarded for compliance with this FOIA request.

This request has been granted expedited processing. It requires timely action from each of us to comply within the time constraints.

If you have any questions or concerns, please contact Rebecca Stone, Melissa Ralph, or Jonathan Fiske.

From: PMT03 Hoc
Sent: Friday, April 01, 2011 12:39 PM
To: Holahan, Patricia; Hardesty, Duane
Subject: RE: PMT on Saturday 4/9

No RAAD yet, but I am working on filling that and many other slots.
Duane

From: Holahan, Patricia
Sent: Friday, April 01, 2011 12:38 PM
To: Hardesty, Duane
Cc: PMT03 Hoc
Subject: Re: PMT on Saturday 4/9

Do we have a RAAD for that day. So long as you're comfortable serving in both roles, I'm OK with it.

Thanks, Trish

From: Hardesty, Duane
To: Holahan, Patricia
Cc: PMT03 Hoc
Sent: Fri Apr 01 12:16:17 2011
Subject: PMT on Saturday 4/9

Trish:
I am on watch as your PMT coordinator on 4/9 day shift (7A-3P).
We are currently having difficulty filling the PAAD on that shift.
Would you have any objections with my functioning both as the PAAD and coordinator for that weekend day shift?
Respectfully,
Duane Hardesty

From: RST09 Hoc
Sent: Saturday, April 02, 2011 6:29 AM
To: RST01 Hoc
Subject: FW: Q on concrete - revised
Attachments: Q on concrete degradation.doc

Follow Up Flag: Follow up
Flag Status: Flagged

From: ET02 Hoc
Sent: Friday, April 01, 2011 11:02 PM
To: RST09 Hoc
Subject: Q on concrete - revised

2021

Q: What degradation mechanism can result from interaction of molten core and concrete?

A: If molten core contacts concrete, a chemical reaction will occur that generates non-condensable gases. This is a slow degradation process relative to many of the other failure mechanisms in play (e.g., hydrogen detonation). Flooding of the drywell will reduce the molten core – concrete interaction.

Q: What degradation mechanism exists for concrete under elevated drywell temperature?

Concrete will degrade when exposed to high temperature. At 1400 – 1500 °C, concrete will lose its structural integrity. These temperatures could be reached if concrete is in direct contact with molten core. If there is direct contact, the temperature of the concrete can raise enough, in the localized area, to cause failure. Concrete in other areas, can weaken, but not lose its integrity. For this reactor design, the concrete of concern is the basemat, which does not have a structural function. More detailed information on this degradation mechanism is available in NUREG/CR-7031, "A Compilation of Elevated Temperature Concrete material Property Data and Information for Use in Assessments of Nuclear Power Plant Reinforced Concrete Structures," December 2010.

Neither of these degradation mechanisms, molten core – concrete interaction or prolonged exposure to elevated drywell temperature, will cause a sudden catastrophic release of radiation that would necessitate evacuation of personnel. The only caveat to this is the indirect over-pressurization of containment due to non-condensable off gassing from the molten core – concrete interaction. Again, this is a slow process, through pressurization, but it could potentially lead to a quick change in containment integrity at the time of failure.

From: LIA07 Hoc
Sent: Saturday, April 02, 2011 6:19 PM
To: OST04 Hoc
Subject: FW: 1800 EDT (April 2, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: USNRC Earthquake-Tsunami Update.040211.1800EDT.pdf

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From: LIA07 Hoc
Sent: Saturday, April 02, 2011 6:19 PM
To: LIA07 Hoc
Subject: 1800 EDT (April 2, 2011) USNRC Earthquake/Tsunami Status Update

Attached, please find a 1800 EDT, April 2, 2011 status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

Please note that this information is "Official Use Only" and is only being shared within the Federal family.

Please call the Headquarters Operations Officer at 301-816-5100 with questions.

Jeremy Susco
Executive Briefing Team Coordinator
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)
jeremy.susco@nrc.gov

aaa/222

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Saturday, April 02, 2011 1:40 PM
To: LIA02 Hoc; LIA01 Hoc; LIA11 Hoc; ET07 Hoc
Cc: Stahl, Eric
Subject: FYI: eInvoice, April 11 for STAHL

Subject: eInvoice, April 11 for STAHL

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Search

Press Releases

Press Release (Apr 03,2011)
Plant Status of Fukushima Daiichi Nuclear Power Station (as of 6:00 PM, April 3)

Updates are underlined

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1 (Shut down)
-Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm on March 12th. It was assumed to be hydrogen explosion.
-At approximately 2:30 am on March 23rd, seawater injection to the nuclear reactor through the feed water system was initiated.
-At approximately 10:50 am on March 24th, white fog-like steam arising from the roof part of the reactor building was observed.
-We had been injecting seawater into the reactor, but from 3:37 pm on March 25th, we started injecting freshwater.
-We had been injecting fresh water to the reactor using fire engines; however we switched over utilizing temporary electrical pump at 8:32 am on March 29th.
-Some of turbine building lights were turned on April 2nd.
-We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:42am to 11:52am on April 3rd we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.

Unit 2(Shut down)
-At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within the chamber decreased.
-We have been injecting seawater into the reactor, but from 10:10 am on March 26th, we started injecting freshwater (with boric acid).
-We had been injecting fresh water in to the reactor utilizing fire pump, however, we switched over to utilizing temporary electrical pump from 6:31 pm on March 27th.
-Some of turbine building lights were turned on April 2nd.
-We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:22am to 0:06pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.

Unit 3(Shut down)
-Explosive sound and white smoke were confirmed at 11:01am March 14th. It was assumed to be hydrogen explosion.
-We had been injecting seawater into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting freshwater.
-We had been injecting fresh water in to the reactor utilizing fire pump, however, we switched over to utilizing temporary electrical pump from 8:30 pm on March 28th.
-Some of turbine building lights were turned on April 2nd.
-We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:03am to 0:16pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.

Unit 4 (outage due to regular inspection)
-At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
-Some of turbine building lights were turned on March 31st .
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 5 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
-At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown. At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically. At around 4:14 pm, March 24th we replaced the pump, and restarted cooling of reactor at around 4:35 pm.
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 6 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
-At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
-In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Today's work for cooling the spent fuel pools
-Water spray by the concrete pump truck to Unit 4 started at 5:14 pm.
-We are considering further spraying subject to the conditions of spent fuel pools.

Draining water from underground floor of turbine buildings
-In regard with transferring water from a condensate storage tank to a suppression pool water surge-tank in unit 1, the work began at 1:55 pm April 3rd.
-Water transfer from a condenser to a condensate storage tank in unit 2, began at approximately 5:10 pm, April 2nd.

Casualties
-Presence of 2 TEPCO employees at the site is not confirmed on March 11th.
-On March 24th, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170 mSv. 2 of them were confirmed that their skins on legs were contaminated. After they were decontaminated, since there was a possibility of beta ray burn injury, they were transferred to Fukushima Medical University Hospital. The third worker was also transferred to Fukushima Medical University Hospital on March 25th. Later, the 3 workers were transferred to National Institute of Radiological Sciences in Chiba Prefecture. They all left the hospital on March 28th.
Regarding this event, TEPCO has reported to the related government ministries and agencies on measures to be taken to assure appropriate radiation dose control and radiation exposure related operations.
We will inform the related parties of countermeasures and continue to take all possible measures to future management.

Others
-We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.
· Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
· Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
· Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
· Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
· Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
· Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
· Determined at 9:37 pm Mar 14th (Around main entrance)
· Determined at 6:51 am Mar 15th (Around main entrance)
· Determined at 8:11 am Mar 15th (Around main entrance)
· Determined at 4:17 pm Mar 15th (Around main entrance)
· Determined at 11:05 pm Mar 15th (Around main entrance)
· Determined at 8:58 am Mar 19th (Around MP5)
From now on, if the measured figure fluctuates and goes above and below 500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly abnormal figure and it is evident that the event is not the continuous same event, we will determine and notify.

-The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
-At around 10:37 am March 21st, water spraying to common spent fuel pool

and finished at 3:30 pm (conducted by TEPCO).
-At around 3:37 pm, March 24th, electricity supply to common spent fuel pool has started from external power source. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
-We found no signs of abnormal situation for the casks by visual observation during the patrol activity. A detailed inspection is under preparation.
-At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
-In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.
*: Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
-By March 22nd, Units 1 through 6 were started to be energized from the external power source.
-At around 11:35 am April 1st, a worker fell into the sea when he got into a barge of the U.S. Forces to repair a hose of the ship. The worker was rescued immediately, and was not injured and not contaminated. The worker will be checked using the whole-body counter to ensure his health.
-The second barge of the U.S. Forces with freshwater to be used to cool down the reactors etc. was towed by a ship of Maritime Self-Defense Force and came alongside the pier at 9:10 am on April 2nd. We began to replenish the filtrate tanks with water of a barge (the first barge) at around 10:20 am on April 2nd and continued until 4:40 pm.
-We began to transfer fresh water from the second barge to the first barge on April 3rd at 9:52 am and continued until 11:15 am on April 3rd.
-We also began to transfer the radioactive water we collected from the building of Radioactive Waste Treatment Facilities to the Unit 4 turbine building.
-Today at around 9:30 am, we detected water containing radiation dose overc 1,000 mSv/h in the pit* where supply cables are stored near the intake channel of Unit 2. Furthermore, there was a crack about 20 cm on the concrete lateral of the pit, from where the water in the pit was out flowing.(We already informed.) During the same day, we injected fresh concrete to the pit, but we could not observe a reduction in the amount of water spilling from the pit to the sea.
Therefore, we considered that a new method of stopping the water and determined to use the polymer. Necessary equipment and experts of water shutoff will be dispatched to the site and after checking the condition, we're doing continuous work to stop water by injecting polymer(April 3rd).
-Monitoring posts of No. 1 ?No.8 set up near the boundary of power station area have been restored. We will periodically monitor the data and announce the results of monitoring.
-We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

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From: ET07 Hoc
Sent: Sunday, April 03, 2011 2:56 AM
To: OST02 HOC
Subject: FW: Japan Tsunami Earthquake Video Images News Updates

-----Original Message-----
From: ET02 Hoc
Sent: Wednesday, March 16, 2011 2:08 AM
To: ET07 Hoc
Subject: Japan Tsunami Earthquake Video Images News Updates

http://www.myfoxphilly.com/subindex/video/tsunami_video

0004/225

From: LIA07 Hoc
Sent: Sunday, April 03, 2011 7:15 PM
To: LIA06 Hoc
Subject: RE: FOIA folder copies of all emails

Hi, Mark,

I'm not seeing any historical information from EBT to FOIA Resource; are we providing you everything you need?

Thanks,

Nichole

From: LIA06 Hoc
Sent: Sunday, April 03, 2011 7:13 PM
To: LIA01 Hoc; LIA02 Hoc; LIA03 Hoc; LIA04 Hoc; LIA05 Hoc; LIA06 Hoc; LIA07 Hoc; LIA08 Hoc; LIA09 Hoc; LIA10 Hoc; LIA11 Hoc; LIA12 Hoc; OST05 Hoc
Subject: FOIA folder copies of all emails

Just a friendly reminder that each liaison needs to be sure to send all emails to the FOIA Resource address at the end of the last shift for that day.

Thanks,

Mark Lombard
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

000326

From: LIA06 Hoc
Sent: Sunday, April 03, 2011 7:16 PM
To: LIA06 Hoc; LIA01 Hoc; LIA02 Hoc; LIA03 Hoc; LIA04 Hoc; LIA05 Hoc; LIA07 Hoc; LIA08 Hoc; LIA09 Hoc; LIA10 Hoc; LIA11 Hoc; LIA12 Hoc; OST05 Hoc
Subject: RE: FOIA folder copies of all emails

PS-there are several ways to do this but I found one easy way is to block all emails since the last one was sent to FOIA and send them as attachments to one email.

Mark
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From: LIA06 Hoc
Sent: Sunday, April 03, 2011 7:13 PM
To: LIA01 Hoc; LIA02 Hoc; LIA03 Hoc; LIA04 Hoc; LIA05 Hoc; LIA06 Hoc; LIA07 Hoc; LIA08 Hoc; LIA09 Hoc; LIA10 Hoc; LIA11 Hoc; LIA12 Hoc; OST05 Hoc
Subject: FOIA folder copies of all emails

Just a friendly reminder that each liaison needs to be sure to send all emails to the FOIA Resource address at the end of the last shift for that day.

Thanks,

Mark Lombard
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From:	LIA02 Hoc
Sent:	Monday, April 04, 2011 2:51 PM
To:	LIA02 Hoc; Doane, Margaret; Mamish, Nader; Abrams, Charlotte; Wittick, Brian; Afshar-Tous, Mugeh; 'ShafferMR@state.gov'; Bloom, Steven; Schwartzman, Jennifer; Tobin, Jennifer; Mayros, Lauren; Jones, Andrea; English, Lance; Smiroldo, Elizabeth; Young, Francis; Henderson, Karen; Ramsey, Jack; Shepherd, Jill; Baker, Stephen; Emche, Danielle; Fragoyannis, Nancy; LIA03 Hoc; Stahl, Eric; Owens, Janice; Fehst, Geraldine; Foggie, Kirk; Breskovic, Clarence
Cc:	LIA07 Hoc; LIA08 Hoc
Subject:	Transition Report April 4, 0630 - 1530
Follow Up Flag:	Follow up
Flag Status:	Flagged

TRANSITION REPORT FOR APRIL 3, 0630 TO 1530
Steve Bloom to Jenny

UPDATES DURING SHIFT

- **Alan Blamey laptop problems.** Alan Blamey contacted HOO about laptop problems. ET contacted OIS Network Operations Center (NOC) at 9:30 pm EDT. **ACTION:** LIA02 may be contacted for follow up.

- **Printer Replacement Requested at Embassy.** Danielle Emche reported at 9 pm EDT April 1 that the computer printer provided by the Embassy has broken down. She asked OIS for suggestions for replacement, including OIS shipping one by Fedex. She noted that purchase/payment in Tokyo would be difficult without pre-approval from NRC and would also require translator assistance. **ACTION:** ET02 forwarded the request to OIS management for resolution. OIS has been in direct contact with Danielle (see emails). Discussed with LT on April 2 at 0700, 1430 and 1730. LT talked to OCFO managers and confirmed that travel card could be used for the team to purchase printer in country and NRC will reimburse, including shipment back to the US. LIA02 should continue to monitor. Sent email to Danielle and Eric at 11:10 on status of buying a new printer, awaiting response. Eric reported in 4/4 email at 5 am that the embassy had provided a new printer. Therefore no further action.

- **Rudy Bernhard BB Issue:** Rudy Bernhard cannot receive e-mail on his BB and leaves for Japan on Saturday, April 2. **ACTION:** OIS was notified of the request at 8:50 pm EDT on April 1 and they are looking into options. OIS is to contact Rudy, LIA02 provided Rudy's BB#. TSC had action to correct. Got email from Rudy at 8:10 am that it was fixed, therefore no further action.

- **New Travelers to Japan.** All travelers have been cleared through USAID and have completed their travel checklist (including Blackberry, laptop, KI and dosimetry pickup). ***The list of travelers has been populated and resides on the M drive in the LT folder – PLEASE USE ONLY THIS VERSION, DATED 4/2 (see next bullet, too).*** The 4/2 updated list was sent to the Japan Team and OST02. Bios for new travelers Bernhard, Call, Hay, and Salay have been requested. Elmo's was pulled from web. **Action:** Bio has been received from Hay and sent, with Elmo's, to Danielle and Eric. When the Bernhard, Call and Salay bios are received, send those to Danielle and Eric.

- **Update Japan Traveler Information Document on LIA03 with Return Team info** – Per request from LT Director please update the traveler table as the original NRC Japan Travel Team members return to U.S. Leave the most recent copy on the cabinet in LIA02 work area. On 3/31 emailed "Liaison Japan" and asked them to notify LIA02 and LIA03 when they arrive in the U.S. Also, added this as an action item to the Return Traveler Checklist. The "NRC Traveler Information in Japan" table has been updated with the

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correct dates. Do not rely on e-mail of April 1 from N. Johnson. Dates for return of Monninger are still unclear. **ACTION:** Await reply emails from returned travelers and update the Document on LIA03.

- **Coordination of IAEA and U.S. Efforts.** While the IAEA's Incident and Emergency Centre (IEC) has not agreed to be a formal "clearinghouse" (i.e., actively reaching out to all IAEA member states requesting that all assistance efforts be coordinated through the IEC), they are tracking all offers for assistance via a database that was posted on ENAC last week. For the effort to be effective, they need input from countries, and they do not have anything from the United States. It was our initial understanding that DoD (Navy) is taking a logistical leadership role in coordinating equipment-provision efforts for the USG. However, INPO has taken the lead on equipment issues although the State Department had taken a lead role in the "Consortium." US Embassy Tokyo had established a tracking system to compile assistance requests from the Japanese and offers from USG entities. INPO had been separately tracking equipment requests (see INPO item below). The Embassy and INPO tracking have been merged, and the Embassy and NRC Team are developing a standardized form that could be filled out for assistance requests. Danielle is checking to see if a standardized form will be developed for solicited or unsolicited offers for assistance from USG entities. Given the concrete actions US Embassy Tokyo is taking, they should take the lead in providing information to IAEA on behalf of the USG. Danielle indicates that Embassy Tokyo is in the process of verifying with State HQ that they can take the lead on this. **Action:** Wait to hear back from Danielle, then confirm whether or not US Embassy Tokyo will be communicating with IAEA/IEC. At 0802 on April 3, LT Coordinator (LIA06) forwarded latest matrix "Japanese Government Action Items and Material Request List" updated from April 2 "Consortium" conference call to Mark Shaffer and Jennifer Holzman. If US Embassy Tokyo has not communicated with IAEA/IEC Mark Shaffer should coordinate with DOS UNVIE about sending to IAEA/IEC. Contacted Emily, she stated in her email at 0702, that Mark will be emailing Embassy POCs.

- **Plant Status Updates.** James Whitney, NSIR has requested that all of the "Plant Status" news releases on ENAC be sent to him to assist other government agencies in their analysis of the situation. **Action:** Send james.whitney@nrc.gov "plant status updates" on ENAC as they come in (last one sent on 0700 shift on 4/4).

- **Announcement of French nuclear safety meeting in May:** Reuters is reporting that Sarkozy has announced plans for a high-level meeting of "G20 nuclear industry officials" in Paris in May 2011 "to define international nuclear safety standards." The article states that Sarkozy "declared this [meeting] would lay the groundwork for the IAEA high-level meeting on June 20-24. We are seeking additional information on this announcement from official channels. Message sent to Eric at 0400 inquiring whether he has heard anything via his French contacts (noting that ASN will be meeting with the NRC Team in the next day or two). Report any new information learned to OIP management and ET. Update 4/2: OIP (Nader/Jack/Karen) participated in DOS-led interagency call 4/1 to discuss this proposed event. On the call were various components of DOS, NSC and various components of DOE. The interagency consensus/USG position is to indicate this meeting is premature as the events in Fukushima are not yet stabilized, and to request that it be delayed until late 2011. This policy will be articulated by DOS high level representatives at a G-20 meeting in Abu Dhabi the week of April 4. This information was provided to the ET and Margie. Mark Shaffer reported 4/2 early am that the French announced their intent to convene this meeting, and stated that the Japanese Prime Minister is supportive. **Action:** OIP will continue to interact with interagency as appropriate and update ET.

- **Tony Nakanishi Returned:** Tony returned his blackberry and the satellite phone, which I gave to ET02 (Robert Stransky). Told Tony to return Dosimeter to ADM desk. Later he returned the dosimeter saying the ADM desk did not know what to do with it. Called up John O'Donnell who came down and picked it up. He will be contacting the ADM desk to let them know the process for accepting the dosimeters. No further action.

FUTURE ACTIONS/OPEN ITEMS

- **News Reports on IAEA "Recommendation" to Extend Evacuation Zone:** News media is reporting that the IAEA has called on Japan to extend the evacuation zone around Fukushima, based on abnormal levels of radiation detected in a village outside the current evacuation zone. This was not a special announcement nor a formal recommendation from the IAEA. Instead, the reports result from information provided at the March 30 IAEA technical briefing, at which DDG Denis Flory reported on the location of the abnormal radiation levels and noted that they were located outside the evacuation zone. When asked a direct question about whether the IAEA was recommending that Japan extend the zone, DDG Flory stated only that the IAEA was encouraging the "counterpart" to "carefully assess the situation." Full summary of technical briefing here: http://iaea.org/newscenter/news/tsunamiupdate01.html, relevant paragraph is the fourth paragraph under item #2, "Radiation Monitoring." Jen Schwartzman verified with Mark Shaffer that no formal announcement has come from IAEA in this regard. **Action:** If asked about this by the ET or other NRC management, provide the above information so there is no confusion about IAEA's position.

- **Taiwan Conference Call.** PMT and RST are available for a 1200 EST one-time conference call with Taiwan, date TBD. The 1500-2300 EST shift on March 31 received a call from Taiwan POC (June-Yuan (JY) Huang, 202-895-1932). He said Danielle Emche had offered the conference call (and Danielle's suggestion stems from DOS push). He doesn't see a need for an immediate conference call. He will call again to set up a date. He would like the conference call to start with a briefing on the technical status at Fukushima and then he will ask questions. After he calls with a date please notify/confirm time and date with PMT and RST. Int'l liaison should sit in on the call. **Action:** Be aware that Mr. Huang will be calling back to set up a specific date. When date is set, please let PMT and RST know that he would like a briefing on the technical status at Fukushima and will have questions.

- **Deputies Committee Decisions and Action Items:** SECY has been sending summaries of the Deputies Committee meetings as they are received and the LT Director/Coordinator have been tracking any actions pertinent to the LT. There are currently no international liaison tasks resulting from these meetings but the LT Director will inform us if this changes. **Action:** Mark Shaffer would like to see the summaries. We sent him everything we had already received but he would need future summaries beginning with the March 30 meeting. Summaries received on 4/3 were sent.

- **Translators.** 24/7 translation coverage has been suspended due to both projected decreasing demand and funding issues. Kirk Foggie confirmed that there is only one known NRC employee that speaks Japanese (at the moment) but there is a Japanese foreign assignee and other options available. Also, Tony Nakanishi will be returning from Japan today and may be available to provide translation assistance beginning Monday. Danielle Emche informed us that USAID is paying for an NRC-dedicated translator in Tokyo. If we need items translated and cannot get assistance from within NRC, we can rely on them. **Action 1:** If in need of USAID translation support, fax the document to +81-3-3224-5538 and send a scanned (PDF) copy to Danielle Emche and Eric Stahl as a backup. **Action 2:** Inform PMT and RST if a decision is made to resume translation services at NRC.

- **INPO:** All equipment requests are now going through INPO. They are consolidating all available information. Contact information for INPO is 770-644-8118 or email at inpoercassistance@inpo.org.

- **NRC Health Unit request:** The NRC team members were given KI before they left. At this time the guidance is to not take the KI while on duty in Tokyo. However, due to the still-fluid nature of the environmental hazards posed by radioactive isotopes, there still exists a possibility that KI could be required at some point. Should it become necessary to have the NRC team take the KI, the LIA02/LIA03 international liaisons would be responsible for receiving the advice from ADM/Dr. Cadoux and to get the information to the team immediately.

- **Request for meteorological data.** PMT notified LIA02/03 of their need for meteorological data. **Action:** If you receive meteorological communications which do not already have PMT on distribution, please ensure PMT is cc'ed on the email (send to PMT02 and PMT12) and walk a hard copy back to the meteorologists.

- **Japan Relief Team Dosimetry.** LIA03 sent an email to LiasonJapan (original team) asking for them to email back their dosimetry numbers. If dosimeter numbers (on the back) are received directly to the international liaison desks they should be forwarded to John O'Donnell and entered into a word document on LIA03. All of original team except Casto and Monninger have returned, so these two should be only numbers missing, if any.

- **Daily calls with UK/France/Canada.** Calls will take place at 0930 with RST and PMT to discuss reactor-related and radiation-related information, respectively, with regulatory representatives from these three countries. Everyone should call into the HOO to be connected. Finland and the IAEA may also participate on an intermittent basis. **The new number to call into is 800-772-3842 and the pin is 6108. NOTE: There is no call on the weekends.**

- **Daily NRC Japan Team – RST/PMT Call.** The time of the call varies. As of 4/3 it was **1700** with RST and PMT have been notified of the call and international liaison should plan on participating (OIP staff in Japan don't necessarily participate). All parties should call into **301-816-5120** and use pass-code **6105.**

DAILY ACTIONS/REMINDERS

- International updates must be sent to LIA07 (to be put in the HOO Status Update) before the end of every shift as well as posted on the LT status board (different than the LT Log).
- The 3-12 PM shift should try and work on the one pager and the 7 AM – 3 PM should finalize and send to Margie. Please include information from email from Danielle and Eric. Margie reminds us that the write-up should not contain technical details, which are already captured in other reports, and should be marked "Official Use Only – Foreign Government Information."
- Both shifts are responsible for sending all emails to the FOIA email address. Open new email, copy previous day's emails as an attachment and send to FOIA Response.hoc@nrc.gov. Also it would be helpful to mark the red flag on the right to show which emails were sent.
- The international team should sit in on calls with the ET and team leader (Chuck or Dan) to take notes and provide a short summary of what was discussed via email to OIP reps on Japan Team. The Chairman's briefing has been moved to 0800 while he is in Vienna, April 4-6, and will involve a three way call with Casto, ET, and Chairman. [Japan 13 hours ahead, Vienna 6 hours ahead]
- Prior to any international call you set up, please make sure you contact the HOOs to let them know that you are going to have an international call.
- Reminder to Keep Mark Shaffer in-the-loop at shaffermr@state.gov, regardless of time of day, regardless of whether he is in the office or asleep. Especially cc Mark on all communication to IAEA.
- Request from RST and PMT to keep them updated on who is currently in Japan on NRC team.
- Please make sure to keep the NRC Japan travelers list updated (check the last updated date) and post a new copy on LIA02 cabinet as changes occur.
- **Sanitary wipes now available. Action:** Please wipe the keyboards, mice and phones before you leave.

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Press Releases

Press Release (Apr 04,2011)
Implementation Plan of Rolling Blackouts on and after April 5, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after April 5, 2011 as follows:

o Implementation plan of rolling blackout on April 5 (Tue)
On April 5, Tuesday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast tomorrow on April 5 and the trend of the power supply.
Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow on April 5. We appreciate your continuous cooperation.

o Implementation plan of rolling blackouts from April 6 (Wed) to April 11 (Mon)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be up to approximately 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out.

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

<Reference>
oPrediction of demand and supply on April 4 and April 5

(MW)

	April 4	April 5
Estimated Demand	36,000	35,000
Supply Capacity	38,500	40,000

aaa 1229

* Prediction of demand
Tomorrow on April 5, since the temperature is forecasted to be higher

than that of today, we assume the estimated peak demand on April 5 will be 35,000MW, which is lower than that of today on April 4.

* Estimated demand and supply capacity may change depending on the situation of the day.

Appendix: Weekly Rolling Blackout Tentative Plan from April 5(Tue)to April 11(Mon) (PDF 17.7KB)

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Press Releases

Press Release (Apr 04,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

*Off-site power has been connected to Unit 1 to 6 by March 22, 2011.

* Unit 1
-The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36 pm, March 12th.
-We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
-At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made. From 10:42am to 11:52am on April 3rd we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
-At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
-At approximately 11:30 am, March 24th, lights in the main control room were restored.
-At approximately 5:00 pm, March 24th, draining water from underground floor of turbine buildings into a condenser was started and it was paused at approximately 7:30 am, March 29th because we confirmed that the water level reached almost full capacity of a condenser. In order to move the water in the condenser into condensate reservoirs, water transfer from the condensate reservoirs to suppression pool's water surge-tanks was conducted from around 0:00 pm, March 31st to 3:26 pm, April 2nd.
-From 1:03 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 4:04 pm.
-In order to confirm the position of water spray to the spent fuel pool by the concrete pumping vehicle, the water spray was conducted from 5:16 pm to 5:19 pm.
-Some of turbine building lights were turned on April 2nd.
-The water transfer from the condenser to the condensate reservoirs has been implemented since 1:55 pm, April 3rd.

*Unit 2
-At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.

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-At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there was a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
Sea water injection to the reactor continued.
-On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
-From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
-At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
-From around 4:00 pm to 5:00 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.
-From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 6:31pm, March 27th, transfer from the fire fighting pump to a temporary motor driven pump was made. From 10:22am to 0:06pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
-From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 12:19 pm, March 25th. From 4:30 pm, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th. At 9:25 am, March 30th, we started fresh water injection by a temporary motor driven pump, but we switched the pump to the fire fighting pump due to the pump trouble. At 1:10 pm, March 30th, freshwater injection was suspended, because we found the crack on a part of the hose. At 7:05 pm, March 30th, freshwater injection was resumed and finished at 11:50 pm, March 31.
-At approximately 4:46 pm, March 26th, lights in the main control room were restored.
-At approximately 4:45 pm, March 29th, the water in condensate reservoirs was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to condensate reservoirs in order to drain water on the underground floor of the turbine building into a condenser. At 11:50 am, April 1st, transfer was completed.
-At 2:56 pm, April 1st, water injection into spent fuel pool in Unit 2 by temporary motor driven pump was initiated. At 5:05 pm on April 1st, the water injection was finished.
-The water transfer from the condenser to the condensate reservoirs has been implemented since 5:10 pm, April 2nd.
-Some of turbine building lights were turned on April 2nd.

*Unit 3
-At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in the Article 15, the Clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
-At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
-As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
-At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it was not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
-In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
-At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
-Before 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
-At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They

resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
-At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
-At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it was slowly dissipating.
-At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 pm on the same day.
-At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
-At approximately 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
-At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
-From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
-From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
-From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water was switched to temporary electricity pumps from the fire engine pumps. From 10:03am to 0:16pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
-At approximately 12:34pm March 27th, the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th, the operation was finished.
-At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.
-At approximately 5:40 pm, March 28th, the water in condensate reservoirs was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to condensate reservoirs in order to drain water on the underground floor of the turbine building into a condenser. We finished the transfer work at approximately 8:40 am, March 31st.
-From 4:30 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 7:33 pm.
-From 9:52 am, April 2nd, the water spray by the concrete pumping vehicle was started, and finished at 0:54 pm.
-Some of turbine building lights were turned on April 2nd.

* Unit 4
-At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
-At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there were no signs of fire.
-At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
-At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
-On March 21st, cabling has been completed from temporary substation to the main power center.
-From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm

on the same day.
-From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
-From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
-From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
-From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
-From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
-At approximately 11:50 am on March 29th, lights in the main control room were restored.
-From 2:04 pm on March 30th, water spray by the concrete pumping vehicle was started and finished at 6:33 pm on March 30th.
-Some of turbine building lights were turned on March 31st.
-From 8:28 am, April 1st, the water spray by the concrete pumping vehicle was started. At 2:14 pm, the water spray finished.
-From 5:14 pm, April 3rd, the water spray by the concrete pumping vehicle was started. At 10:16 pm, the water spray finished.

*Unit 5 and 6
-At 5:00 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
-Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
-At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
-At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

*On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool was secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
*common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

*On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection was under preparation.
*dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* On March 21st, 23rd to 30th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater around the discharge canal of the station.

* On March 20th, 21st, 23rd to 30th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station.

* Plutonium has been detected from the sample of soil at the site of Fukushima Daiichi Nuclear Power Station collected on 21st and 22nd of March, Concentration level of Plutonium detected was same as that of under usual environment and it was thought not to be harmful to human health. We will strengthen environmental monitoring of power station and surrounding environment.

* We detected radioactive materials contained in the puddles found in the turbine building of Unit 1 to 4.

* At approximately 3:30 pm, March 27th, we found water pooling in the vertical shaft of the trench outside of the turbine buildings for Units 1 to 3. The radiation dose at the surface of the water amounted 0.4 mSv/h in Unit 1 and over 1,000 mSv/h in Unit 2. We could not confirm the amount of the radiation dose in Unit 3. We will keep observing the condition of the water in the vertical shaft.
On March 29th, we detected niobium, tellurium, ruthenium, silver, tellurium, iodine, cesium, and ruthenium in the water collected at the trench of unit 1.
On March 30th, we took samples from the water in the trench of Unit 2 and 3, and conducted nuclide analysis on them. We are now confirming the results of the analysis.

*At approximately 9:30 am, April 2nd, we found that there was water in

the shaft for storing power cable (concrete product) near the intake of water for Unit 2, the radioactive air dose was over 1,000mSv/h and the water spilled into the sea from the crack (approximately 20 cm) on the side of the shaft. We injected fresh concrete to the shaft twice, however, we could not observe a change in the amount of water flowing into the sea. Therefore, we considered that a new method of stopping the water and determined to use the polymer. Necessary equipment and experts of water shutoff will be dispatched to the site and after checking the condition, we began to stop water shutoff and were injecting polymer on April 3rd. Today on April 4th, we are injecting the tracer from the vertical shaft of the trench to start to examine the water current.
There is a connection point between the tunnel of unit 2 and this shaft. It was assumed that a puddle of water in the turbine building of unit 2, out flowed through this connection point and spilled into the sea from the crack of the shaft. Therefore, we will investigate out flowed route to the shaft and implement the water analysis by taking samples in the shaft near the spilling point to the sea. In addition, from April 2nd, we will implement sampling at 15km offshore Fukushima Daiichi and Fukushima Daini Nuclear Power Stations and will evaluate these samples comprehensively.

*Since approximately 9:20 am, March 31st, the water transfer from the vertical shaft of Unit 1 to the reservoir of the centralized environmental facility was conducted. We finished the task around 11:25 am of the same day.

* We found a puddle of water at the main building of the centralized environmental facility process. We analyzed and detected approximately 1.2×10^{1}Bq/cm3 of radioactivity in full dose in the Controlled Area and 2.2×10^{1}Bq/cm3 in full dose in the Non-Controlled Area on March 29.

* From April 2nd, we also began to transfer the radioactive water we collected from the building of Radioactive Waste Treatment Facilities to the Unit 4 turbine building.

* The first barge of the U.S. Forces with fresh water to be used to cool down reactors etc. was towed by a ship of Maritime Self-Defense Force and docked at 3:42 pm on March 31st 2011. At approximately 3:58 pm, April 1st, we started to replenish filtrate tanks with the fresh water, and finished at 4:25 pm. At approximately 10:20 am, April 2nd, we resumed replenishing filtrate tanks with the fresh water, and finished at 4:40 pm. The second barge of the U.S. Forces with the fresh water towed by the ship of Maritime Self-Defense Force came alongside the pier at approximately 9:10 am, April 2nd. It was in preparation for replenishing filtrate tanks with the fresh water. We began to transfer fresh water from the second barge to the first barge on April 3rd at 9:52 am and continued until 11:15 am on April 3rd.

* At 11:35 am, April 1st, a worker fell into the sea while stepping into the ship from the pier during the hose laying work of the barge. Other crew immediately rescued the worker. While no injury or contamination was confirmed, whole body counter will be implemented to check the contamination inside the body just in case.

* From 3:00 pm, April 1st, we started spraying inhibitor in order to prevent diffusion of radioactive materials. This attempt was conducted on a trial basis at the mountain side area of the common spent fuel pool in the range of 500m2. The spraying finished at 4:05 pm.

* Monitoring posts (no.1 to no.8) which were installed around the site boundary have been restored. We will continue monitoring the measured value and make announcements on those values accordingly.

*We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:
Units 1 to 4: shutdown due to the earthquake
* The national government has instructed evacuation for those local residents within 10km radius of the periphery.

* In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

*At 2:30 pm on March 30th, the power source of the residual heat removal system (B) to cool the reactor of Unit 1 was secured from an emergency power source in addition to an offsite power. This means that all the units secure backup power sources (emergency power sources) for the residual heat removal system (B).

* Unit 1
As it was confirmed that the temperature of the Emergency Equipment Cooling Water System *1 has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently,

failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

* Unit 4
As it was confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

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

Kashiwazaki Kariwa Nuclear Power Station:
Units 1, 5, 6, 7: normal operation
(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]
-Hirono Thermal Power Station Units 2 and 4: shutdown due to the earthquake
-Hitachinaka Thermal Power Station Unit 1: shutdown due to the earthquake
-Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to the earthquake

[Hydro Power Station]
-Power supply has returned to normal, but facilities damaged by the earthquake are now being handled in a timely manner.

[Impacts on Transmission Facilities]
-Power supply has returned to normal, but facilities damaged by the earthquake are now being handled in a timely manner.

[Potential Implementation on Planned Rolling Blackouts and Request for Conserving Electricity Consumption]
-Considering the critical balance of our power supply capacity and expected power demand going forward, in order to avoid unexpected blackout in large areas, TEPCO has been implementing rolling blackout (planned blackout alternates from one area to another) since March 14th. We will make our utmost to secure the stable power supply as early as possible. For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by turning of unnecessary lights and electrical equipment.

[Others]
-Please do NOT touch cut-off electric wires.
-In order to prevent fire, please make sure to switch off the electric appliances such as hair driers when you leave your house.
-For the customer who has in-house power generation, please secure fuel for generator.

back to page top

From: ET02 Hoc
Sent: Monday, April 04, 2011 6:14 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Japan Team Returnees

Follow Up Flag: Follow up
Flag Status: Flagged

Could you please give me a list of who has returned from Japan so I can update my list? Thanks..karen

000231

From: HOO Hoc
Sent: Monday, April 04, 2011 7:01 AM
To: ET07 Hoc
Subject: FW: Tentative Request: Briefing for Chairman 0800 EDT

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: (301) 816-5148
Fax: (301) 816-5151
Email: hoo.hoc@nrc.gov
Secure Email: hoo@nrc.sgov.gov

-----Original Message-----
From: Pace, Patti
Sent: Monday, April 04, 2011 7:00 AM
To: HOO Hoc
Subject: Re: Tentative Request: Briefing for Chairman 0800 EDT

Hello,

Next window of availability for Chairman is to start sometime between 5:30p/5:45p Vienna time (11:30a/11:45a EDT). Since we are unsure of when exactly, I have asked for the Chairman to call in to start the briefing. Please confirm.

Thanks
Patti Pace
U.S. Nuclear Regulatory Commission
(301) 415-1820

----- Original Message -----
From: HOO Hoc
To: Pace, Patti
Sent: Mon Apr 04 06:48:49 2011
Subject: RE: Tentative Request: Briefing for Chairman 0800 EDT

Ok. Just let us know when.

Howie Crouch

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: (301) 816-5148
Fax: (301) 816-5151

QQQ/232

Email: hoo.hoc@nrc.gov
Secure Email: hoo@nrc.sgov.gov

-----Original Message-----
From: Pace, Patti
Sent: Monday, April 04, 2011 6:38 AM
To: HOO Hoc
Cc: Batkin, Joshua
Subject: Re: Tentative Request: Briefing for Chairman 0800 EDT

Thanks. Just received a message from Chairman that his schedule has changed and 0800 EDT will no longer work. I am standing by for new time from staff with Chairman in Vienna. I will advise ASAP.
Patti Pace
U.S. Nuclear Regulatory Commission
(301) 415-1820

----- Original Message -----
From: HOO Hoc
To: Pace, Patti
Sent: Mon Apr 04 06:33:01 2011
Subject: RE: Tentative Request: Briefing for Chairman 0800 EDT

ET and Mr. Casto will be available to brief. Please advise if you want us to contact the Chairman at 0800 EDT.

Regards,
Howie Crouch

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: (301) 816-5148
Fax: (301) 816-5151
Email: hoo.hoc@nrc.gov
Secure Email: hoo@nrc.sgov.gov

-----Original Message-----
From: Pace, Patti
Sent: Monday, April 04, 2011 6:27 AM
To: HOO Hoc
Cc: Batkin, Joshua
Subject: Tentative Request: Briefing for Chairman 0800 EDT

Good Morning,

I am awaiting confirmation, but a preliminary look at Chairman's schedule in Vienna today has an opening at 2:00p Vienna time/ 0800 EDT. Please advise if the ET and Mr. Casto would be able to call the Chairman to provide a status briefing at that time.

Thanks,

Patti Pace
U.S. Nuclear Regulatory Commission
(301) 415-1820

From: HOO Hoc
Sent: Monday, April 04, 2011 6:31 AM
To: ET07 Hoc
Subject: FW: Tentative Request: Briefing for Chairman 0800 EDT

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: (301) 816-5148
Fax: (301) 816-5151
Email: hoo.hoc@nrc.gov
Secure Email: hoo@nrc.sgov.gov

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Thanks,

Patti Pace
U.S. Nuclear Regulatory Commission
(301) 415-1820

000233

From: HOO Hoc
Sent: Monday, April 04, 2011 7:07 AM
To: ET07 Hoc
Subject: FW: Tentative Request: Briefing for Chairman 0800 EDT

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: (301) 816-5148
Fax: (301) 816-5151
Email: hoo.hoc@nrc.gov
Secure Email: hoo@nrc.sgov.gov

-----Original Message-----
From: Pace, Patti
Sent: Monday, April 04, 2011 7:06 AM
To: HOO Hoc
Subject: Re: Tentative Request: Briefing for Chairman 0800 EDT

Yes, either he will call Ops center directly or I will facilitate call and connect him through to you. Thank you!
Patti Pace
U.S. Nuclear Regulatory Commission
(301) 415-1820

----- Original Message -----
From: HOO Hoc
To: Pace, Patti
Sent: Mon Apr 04 07:03:23 2011
Subject: RE: Tentative Request: Briefing for Chairman 0800 EDT

ET is okay with it. I understand that the Chairman will call in?

Howie Crouch

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: (301) 816-5148
Fax: (301) 816-5151
Email: hoo.hoc@nrc.gov
Secure Email: hoo@nrc.sgov.gov

aaa/234

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From: Pace, Patti
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U.S. Nuclear Regulatory Commission
(301) 415-1820

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To: Pace, Patti
Sent: Mon Apr 04 06:48:49 2011
Subject: RE: Tentative Request: Briefing for Chairman 0800 EDT

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Howie Crouch

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
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U.S. Nuclear Regulatory Commission
(301) 415-1820

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Regards,
Howie Crouch

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: (301) 816-5148
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Cc: Batkin, Joshua
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Thanks,

Patti Pace
U.S. Nuclear Regulatory Commission
(301) 415-1820

From: LIA06 Hoc
Sent: Monday, April 04, 2011 7:18 AM
To: LIA02 Hoc
Subject: FW: RESPONSE/QUERY - Go Book Update - 0600 EDT, April 4, 2011

fyi

Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From: Weber, Michael
Sent: Monday, April 04, 2011 6:47 AM
To: LIA07 Hoc
Cc: LIA06 Hoc; LIA08 Hoc; ET05 Hoc; ET01 Hoc; RST01 Hoc; PMT01 Hoc; FOIA Response.hoc Resource; OST02 HOC
Subject: RESPONSE/QUERY - Go Book Update - 0600 EDT, April 4, 2011

At this point, is the collective view of the Ops Center Team and the NRC Team in Japan that the IAEA status report on the units is credible and reliable? Should we stop issuing a separate sitrep on the status of the plants and defer instead to the IAEA's assessment?

From: LIA07 Hoc
Sent: Monday, April 04, 2011 6:02 AM
To: Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Cc: LIA07 Hoc
Subject: Go Book Update - 0600 EDT, April 4, 2011

Attached, please find updated information for the "Go Books".

The updates include:

- The 0430 EDT, 04/04/11 Status Update
- The latest ET Chronology
- TEPCO Press Release (257-260)
- IAEA Status Update, 0000 UTC 04/04/11

Please let me know if you have any questions or concerns.

-Jim

Jim Anderson
Executive Briefing Team Coordinator
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)
James.anderson@nrc.gov

000235

From: ET07 Hoc
Sent: Monday, April 04, 2011 7:21 PM
To: Hoc, PMT12
Subject: RE:

Done

From: Hoc, PMT12
Sent: Monday, April 04, 2011 6:36 PM
To: ET07 Hoc
Cc: PMT03 Hoc
Subject:

Please forward to CAs and post on sharepoint site.

PMT, PAAD

000236

From: LIA08 Hoc
Sent: Monday, April 04, 2011 2:52 PM
To: Thaggard, Mark
Cc: LIA06 Hoc
Subject: RE: Longer Term Actions
Attachments: NRC Response to Inquiry regarding Japan events

This action was closed out over the weekend (see the attached), and the associated Task was closed in the Task Tracker.
Rani

From: Thaggard, Mark
Sent: Monday, April 04, 2011 2:39 PM
To: LIA06 Hoc; LIA08 Hoc
Subject: FW: Longer Term Actions

Can we have someone contact R. Reed and provide him these links. This will close out Task 2242?

From: Sanfilippo, Nathan
Sent: Monday, April 04, 2011 2:07 PM
To: Thaggard, Mark; Andersen, James
Subject: RE: Longer Term Actions

SRM:
http://adamswebsearch2.nrc.gov/IDMWS/ViewDocByAccession.asp?AccessionNumber=ML110820875

Press release and charter:
http://pbadupws.nrc.gov/docs/ML1109/ML110910479.pdf

From: Thaggard, Mark
Sent: Monday, April 04, 2011 2:00 PM
To: Andersen, James; Sanfilippo, Nathan
Subject: RE: Longer Term Actions

Yes, we have the contact information for Reed. He is with the WH.

From: Andersen, James
Sent: Monday, April 04, 2011 12:55 PM
To: Sanfilippo, Nathan; Thaggard, Mark
Subject: RE: Longer Term Actions

Mark, if Nathan provides the link to the site to the op center, can the op center get it to the requester. We can at least close this one out. Thanks.

Jim A.

From: Sanfilippo, Nathan
Sent: Monday, April 04, 2011 12:46 PM
To: Thaggard, Mark; Andersen, James
Subject: RE: Longer Term Actions

QQQ | 237

I don't know who R. Reed is, but if the Ops Center has a number, whomever received the request could just call and direct him/her to the publicly available SRM, press releases, and charter.

From: Thaggard, Mark
Sent: Monday, April 04, 2011 12:42 PM
To: Sanfilippo, Nathan; Andersen, James
Subject: RE: Longer Term Actions

Not really sure how best to handle this. Clearly this task should not be assigned to FSME, but on the other hand it is not something that the Ops. Center should handle.

From: Sanfilippo, Nathan
Sent: Monday, April 04, 2011 12:31 PM
To: Andersen, James
Cc: Thaggard, Mark
Subject: RE: Longer Term Actions

Jim,

In general, I know the task force won't have time to respond to outside requests. I agree that something like 2242, could be handled by sending him the SRM and charter. I just don't know who should be assigned to do that. If it's just an email, we could, but if it's more, I don't know.

Logistically, ticketing the task force will be tricky since we don't have an organization. Anything ticketed to Charlie would go to FSME?

Nathan

From: Andersen, James
Sent: Monday, April 04, 2011 12:19 PM
To: Sanfilippo, Nathan
Cc: Thaggard, Mark
Subject: FW: Longer Term Actions

Nathan, I'm working with the op center to set up a process for longer term action items. Mark has outlined a process below. One hole in the process is the items being captured by the near-term task force (see item #2242 below as the first example). Do you have a way to capture these types of things so that the op center can then close them out in their tracking system? Thanks.

Jim A.

From: Thaggard, Mark
Sent: Monday, April 04, 2011 11:21 AM
To: Andersen, James
Cc: FOIA Response.hoc Resource
Subject: RE: Longer Term Actions

The process that I propose for handling tasks that fall outside of the purview of the Operations Center is as follows:

1. The assigned Ops. Center team will forward the action to the appropriate program office.
2. You will be cc'd on the request to the program office.
3. The program office will be requested to respond with the assigned ticked number to acknowledge acceptance of the action.

4. You (OEDO) will reassign if the activity is not accepted by the program office.
5. The Ops. Center task will be closed upon receipt of the ticket number from the assigned program office.

Let me know if this is acceptable with you. In terms of the two tasks listed in your email, I suggest ticketing NRR to handle the first task. I am not sure how best to handle the second task (2242); however, I don't see the downside to ticketing Charlie Miller.

From: Andersen, James
Sent: Monday, April 04, 2011 10:54 AM
To: Thaggard, Mark
Subject: FW: Longer Term Actions

From: ET05 Hoc
Sent: Friday, April 01, 2011 12:21 PM
To: Andersen, James; McDermott, Brian
Cc: Jaegers, Cathy; Clayton, Kathleen; Muessle, Mary; Evans, Michele; Morris, Scott; Mamish, Nader; Landau, Mindy; ET07 Hoc
Subject: RE: Longer Term Actions

#2931: ** This supersedes records 2927 and 2536. Please add comments to this record instead of adding addition records related to TMI. **

The Japanese government requests that we provide available documents on our experience with TMI-2, including how fuel was removed from the vessel and lessons learned from the process.

Please assign this task as appropriate. There is no specific due date, but the effort to determine what to do with damaged fuel should be a high priority.

For awareness, INPO was requested to provide similar information.

LT Director to discuss this assignment to ensure it is tasked to the appropriate folks. Tony McMurtry assigning to organization outside this tasking list. As such, the task is rejected by the LT.

Awaiting response from OEDO on process for ticketing actions outside of the Ops Center into the line organization, especially those that are longer term.

Due: 04/01/2011; 23:24:00; Requester: Mike Scott (site team)

#2242: **Desc:** Craft response to inquiry by R. Reed which asked that the NRC assess the ability of the US infrastructure to handle the current emergency in Japan (earthquake, tsunami, reactor, etc) if it were to occur to a domestic reactor. This is tasked to Charles Miller per Martin Virgilio using SRM and Charter.
Response: When SRM is issued forward to R. Reed for response.

Due: 04/04/2011, 06:22:14; Requester: WH

From: Andersen, James
Sent: Friday, April 01, 2011 11:42 AM

To: McDermott, Brian; ET05 Hoc
Cc: Jaegers, Cathy; Clayton, Kathleen; Muessle, Mary; Evans, Michele; Morris, Scott; Mamish, Nader; Landau, Mindy
Subject: RE: Longer Term Actions

Brian / ET05,

Can you send me the list of questions you have and any future questions like these (assigned to OST). We will review here in OEDO, probably with the help of the program office and OIP, and then track as needed (either through OEDO or office tracking systems). Since the Operations Center team has the background on all the requests from Japan, it would be helpful if the team could recommend whether they fell the request is reasonable, who the lead office should be, and if coordination is needed with other offices. I assume the incoming will identify who the response should be sent back to and the requested due date. Thanks.

Jim A.

From: McDermott, Brian
Sent: Friday, April 01, 2011 9:50 AM
To: Andersen, James; Mamish, Nader
Cc: RidsEdoMailCenter Resource; Jaegers, Cathy; Clayton, Kathleen; Muessle, Mary; Evans, Michele; Morris, Scott
Subject: RE: Longer Term Actions

Jim,

My understanding is that after we spoke, the approach we discussed was put on hold by OEDO staff.

Currently, requests are building up in the Ops Center tracker or are being informally taken on by various program offices. I do not believe this is an efficient or effective way to handle the Situation. Unfortunately, I've been standing watch and have not been able to tackle this issue.

We should anticipate additional requests for technical assistance from the GOJ. We absolutely need a process to validate these requests (are they within NRC capabilities, are they better addressed by another agency, can they be supported by the program offices, etc..). Given the potential resource implications, I believe the Offices should be part of the vetting process. Once a GOJ request is validated for NRC action, we need to identify the appropriate lead Office and track to completion.

I believe that this type of activity would best be lead by OIP or OEDO. Any assistance you can provide in establishing a longer term solution would be greatly appreciated.

Brian

From: Andersen, James
Sent: Thursday, March 24, 2011 8:55 AM
To: McDermott, Brian; OST02 HOC
Cc: RidsEdoMailCenter Resource; Jaegers, Cathy; Clayton, Kathleen; Muessle, Mary
Subject: Longer Term Actions

Brian, as we discussed, if there are longer term actions we need to track from the EDO's office, please send the request, recommended lead office, if coordination is needed with other offices, deliverable (memo, e-mail, etc), and due date to the folks on this e-mail. Thanks.

Jim A.

From: ET07 Hoc
Sent: Monday, April 04, 2011 12:05 PM
To: Cianci, Sandra
Subject: RE: Near-term Task Force Charter

Thanks

From: Cianci, Sandra
Sent: Monday, April 04, 2011 12:05 PM
To: ET07 Hoc
Cc: Marshall, Jane
Subject: FW: Near-term Task Force Charter
Importance: High

Per your request

Sandy Cianci
Administrative Assistant to Marty Virgilio, DEDR
Office of the Executive Director for Operations
O-17 H13
301-415-1714
sandra.cianci@nrc.gov

From: Virgilio, Martin
Sent: Monday, April 04, 2011 12:04 PM
To: Cianci, Sandra
Subject: FW: Near-term Task Force Charter
Importance: High

FYI

From: Sanfilippo, Nathan
Sent: Thursday, March 31, 2011 3:43 PM
To: Batkin, Joshua; Bubar, Patrice; Sosa, Belkys; Sharkey, Jeffry; Nieh, Ho
Cc: Borchardt, Bill; Miller, Charles; Virgilio, Martin; Muessle, Mary; Andersen, James; Landau, Mindy
Subject: Near-term Task Force Charter
Importance: High

Commission EAs:

Attached is a copy of the near-term task force memo and charter that was approved by the EDO late yesterday (ADAMS Package ML11089A050). These documents are being declared in ADAMS and will soon be available to the public. Either later today or tomorrow an internal yellow announcement and an external press release will be issued.

2238

Given my role as an ETA and as a member of the task force, I'll likely be a good point of contact for Commission questions about our activities.

Thanks,
Nathan

March 30, 2011

MEMORANDUM TO: Martin J. Virgilio
Deputy Executive Director
for Reactor and Preparedness Programs
Executive Director for Operations

Charles L. Miller, Director
Office of Federal and State Materials
and Environmental Management Programs

FROM: R. W. Borchardt */RA/*
Executive Director for Operations

SUBJECT: AGENCY TASK FORCE TO CONDUCT NEAR-TERM EVALUATION OF THE NEED FOR AGENCY ACTIONS FOLLOWING THE EVENTS IN JAPAN

On March 11th, 2011, Japan experienced a severe earthquake resulting in the shutdown of multiple reactors. It appears that the reactors' response to the earthquake went according to design. At the Fukushima Daiichi site, the earthquake caused the loss of normal AC power. In addition, it appears that the ensuing tsunami caused the loss of emergency AC power at the Fukushima Daiichi site. Subsequent events caused damage to fuel and radiological releases offsite.

The purpose of this memorandum is to task the Deputy Executive Director for Reactor and Preparedness Programs (DEDR) to convene an agency task force of U.S. Nuclear Regulatory (NRC) senior leaders and experts. The task force should conduct a methodical and systematic review of relevant NRC regulatory requirements, programs, and processes, and their implementation, to recommend whether the agency should make near-term improvements to our regulatory system. The task force should also identify a framework and topics for review and assessment for the longer-term effort.

Attached is a charter for the task force. The charter defines the objective, scope, coordination and communication, expected products, schedule, staffing, and Executive Director for Operations interface. The task force should update the Commission on the near-term review at approximately 30 and 60 days, and provide its observations, findings, and recommendations in the form of a written report and briefing at the completion of the near-term effort occurring at approximately 90 days.

The review should be conducted in accordance with Tasking Memorandum – COMGBJ-11-0002, "NRC Actions Following the Events in Japan."

Enclosure: As stated

CONTACT: Nathan T. Sanfilippo, OEDO
301-415-3951

March 30, 2011

MEMORANDUM TO: Martin J. Virgilio
Deputy Executive Director
for Reactor and Preparedness Programs
Executive Director for Operations

Charles L. Miller, Director
Office of Federal and State Materials
and Environmental Management Programs

FROM: R. W. Borchardt */RA/*
Executive Director for Operations

SUBJECT: AGENCY TASK FORCE TO CONDUCT NEAR-TERM EVALUATION OF THE NEED FOR AGENCY ACTIONS FOLLOWING THE EVENTS IN JAPAN

On March 11th, 2011, Japan experienced a severe earthquake resulting in the shutdown of multiple reactors. It appears that the reactors' response to the earthquake went according to design. At the Fukushima Daiichi site, the earthquake caused the loss of normal AC power. In addition, it appears that the ensuing tsunami caused the loss of emergency AC power at the Fukushima Daiichi site. Subsequent events caused damage to fuel and radiological releases offsite.

The purpose of this memorandum is to task the Deputy Executive Director for Reactor and Preparedness Programs (DEDR) to convene an agency task force of U.S. Nuclear Regulatory (NRC) senior leaders and experts. The task force should conduct a methodical and systematic review of relevant NRC regulatory requirements, programs, and processes, and their implementation, to recommend whether the agency should make near-term improvements to our regulatory system. The task force should also identify a framework and topics for review and assessment for the longer-term effort.

Attached is a charter for the task force. The charter defines the objective, scope, coordination and communication, expected products, schedule, staffing, and Executive Director for Operations interface. The task force should update the Commission on the near-term review at approximately 30 and 60 days, and provide its observations, findings, and recommendations in the form of a written report and briefing at the completion of the near-term effort occurring at approximately 90 days.

The review should be conducted in accordance with Tasking Memorandum – COMGBJ-11-0002, "NRC Actions Following the Events in Japan."

Enclosure: As stated

CONTACT: Nathan T. Sanfilippo, OEDO
301-415-3951

ADAMS Package: ML11089A050

OFFICE:	OEDO/Task Force	FSME/Task Force Lead	EDO/DEDR	EDO
NAME:	NSanfilippo	CMiller	MVirgilio (ELeeds for)	RWBorchardt
DATE:	03/30/11	03/30/11	03/30/11	03/30/11

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CHARTER FOR THE NUCLEAR REGULATORY COMMISSION TASK FORCE

TO CONDUCT A NEAR-TERM EVALUATION OF THE NEED FOR AGENCY ACTIONS

FOLLOWING THE EVENTS IN JAPAN

Objective

The objective of this task force is to conduct a methodical and systematic review of relevant NRC regulatory requirements, programs, and processes, and their implementation, to recommend whether the agency should make near-term improvements to our regulatory system. This task force will also identify a framework and topics for review and assessment for the longer-term effort.

Scope

The task force review will include the following:

a. A near-term review to:

- Evaluate currently available technical and operational information from the events that have occurred at the Fukushima Daiichi nuclear complex in Japan to identify potential or preliminary near-term/immediate operational or regulatory actions affecting domestic reactors of all designs, including their spent fuel pools. The task force will evaluate, at a minimum, the following technical issues and determine priority for further examination and potential agency action:
    - External event issues (e.g. seismic, flooding, fires, severe weather)
    - Station blackout
    - Severe accident measures (e.g., combustible gas control, emergency operating procedures, severe accident management guidelines)
    - 10 CFR 50.54 (hh)(2) which states, "Each licensee shall develop and implement guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire, to include strategies in the following areas: (i) Fire fighting; (ii) Operations to mitigate fuel damage; and (iii) Actions to minimize radiological release." Also known as B.5.b.
    - Emergency preparedness (e.g., emergency communications, radiological protection, emergency planning zones, dose projections and modeling, protective actions)
- Develop recommendations, as appropriate, for potential changes to NRC's regulatory requirements, programs, and processes, and recommend whether generic communications, orders, or other regulatory actions are needed.

ENCLOSURE

b. Recommendations for the content, structure, and estimated resource impact for the longer-term review.

Coordination and Communications

The near-term task force will:

- Solicit stakeholder input as appropriate, but remain independent of industry efforts.
- Coordinate and cooperate where applicable with other domestic and international efforts reviewing the events in Japan for additional insights.
- Provide recommendations to the Commission for any immediate policy issues identified prior to completion of the near-term review.
- Provide recommendations to program offices for any immediate actions not involving policy issues, prior to completion of the near-term review.
- Identify resource implications of near-term actions.
- Consider information gained from Temporary Instruction 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Events."
- Develop a communications plan.
- Update and brief internal stakeholders, as appropriate.

Expected Product and Schedule

The task force will provide its observations, conclusions, and recommendations in the form of a written report to the Deputy Executive Director for Reactor and Preparedness Programs at the completion of the 90-day near-term review.

During the development of its report, the task force will brief the Commission on the status of the review at approximately the 30- and 60-day points.

The report will be transmitted to the Commission via a SECY paper, and the task force will brief the Commission on the results of the near-term effort at approximately the 90-day point. The report will be released to the public via normal Commission processes.

The task force will recommend a framework for a longer-term review as a part of the near-term report. The longer-term review will begin as soon as the NRC has sufficient technical information from the events in Japan (with a goal of beginning by the end of the near-term review).

Staffing

The task force will consist of the following members:

Leader	Charles Miller	FSME
Senior Managers	Daniel Dorman	NMSS
	Jack Grobe	NRR
	Gary Holahan	NRO
Senior Staff	Amy Cubbage	NRO
	Nathan Sanfilippo	OEDO
Administrative Assistant	Cynthia Davidson	OGC

Additional task force members will be added as needed. For the near-term review, other staff members may be consulted on a part-time basis.

EDO Interface

The task force will keep agency leadership informed on the status of the effort and provide early identification of significant findings. The task force will report to Martin J. Virgilio, Deputy Executive Director for Reactor and Preparedness Programs.

From: Kreuter, Jane
Sent: Tuesday, April 05, 2011 1:19 PM
To: Young, Francis
Cc: LIA02 Hoc; LIA03 Hoc
Subject: FW: Japan Personnel

Can you check these lists in the ops center? My lists indicate a total of 28 with 15 still in Japan.

From: Abrams, Charlotte
Sent: Tuesday, April 05, 2011 11:31 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Kreuter, Jane
Subject: RE: Japan Personnel

There is a set of tables with all of the Japan travelers listed (Teams 1 through 3) with their contact information and dates of travel. The tables contain PII so should be kept internal. The file is listed as Japan Team on the computer in the ops center in the LT folder.

From: Kreuter, Jane
Sent: Tuesday, April 05, 2011 11:28 AM
To: Abrams, Charlotte
Subject: Japan Personnel

Charlotte,

Skip called asking if we had a current list of NRC personnel in Japan. I only have the attached and not sure if it is even current. Skip said that Michael Dudek is looking for the list and also wanted to know who is still in Japan. What do you think?

Jane A. Kreuter
U.S. Nuclear Regulatory Commission
Office of International Programs
Phone: 301-415-1780
Fax: 301-415-2395
E-Mail: Jane.Kreuter@nrc.gov

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Search

Press Releases

Press Release (Apr 05,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power has been connected to Unit 1 to 6 by March 22, 2011.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36 pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made. From 10:42am to 11:52am on April 3rd we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.
- At approximately 5:00 pm, March 24th, draining water from underground floor of turbine buildings into a condenser was started and it was paused at approximately 7:30 am, March 29th because we confirmed that the water level reached almost full capacity of a condenser. In order to move the water in the condenser into a condensate storage tank, water transfer from the condensate storage tank to suppression pool's water surge-tanks was conducted from around 0:00 pm, March 31st to 3:26 pm, April 2nd.
- From 1:03 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 4:04 pm.
- In order to confirm the position of water spray to the spent fuel pool by the concrete pumping vehicle, the water spray was conducted from 5:16 pm to 5:19 pm.
- Some of turbine building lights were turned on April 2nd.
- The water transfer from the condenser to the condensate storage tank has been implemented since 1:55 pm, April 3rd.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached

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the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there was a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4:00 pm to 5:00 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 6:31pm, March 27th, transfer from the fire fighting pump to a temporary motor driven pump was made. From 10:22am to 0:06pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 12:19 pm, March 25th. From 4:30 pm, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th. At 9:25 am, March 30th, we started fresh water injection by a temporary motor driven pump, but we switched the pump to the fire fighting pump due to the pump trouble. At 1:10 pm, March 30th, freshwater injection was suspended, because we found the crack on a part of the hose. At 7:05 pm, March 30th, freshwater injection was resumed and finished at 11:50 pm, March 31.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.
- At approximately 4:45 pm, March 29th, the water in a condensate storage tank was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to a condensate storage tank in order to drain water on the underground floor of the turbine building into a condenser. At 11:50 am, April 1st, transfer was completed.
- At 2:56 pm, April 1st, water injection into spent fuel pool in Unit 2 by temporary motor driven pump was initiated. At 5:05 pm on April 1st, the water injection was finished.
- The water transfer from the condenser to the condensate storage tank has been implemented since 5:10 pm, April 2nd.
- Some of turbine building lights were turned on April 2nd.
- At 11:05 am, April 4th, water injection into spent fuel pool in Unit 2 by a temporary motor driven pump was initiated. At 1:37 pm, April 4th, the water injection was finished.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in the Article 15, the Clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it was not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- Before 2:00 pm, March 18th, spraying water by fire engines was started

with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it was slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 pm on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At approximately 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water was switched to temporary electricity pumps from the fire engine pumps. From 10:03am to 0:16pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
- At approximately 12:34pm March 27th, the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th, the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.
- At approximately 5:40 pm, March 28th, the water in a condensate storage tank was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to a condensate storage tank in order to drain water on the underground floor of the turbine building into a condenser. We finished the transfer work at approximately 8:40 am, March 31st.
- From 4:30 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 7:33 pm.
- From 9:52 am, April 2nd, the water spray by the concrete pumping vehicle was started, and finished at 0:54 pm.
- Some of turbine building lights were turned on April 2nd.
- From 5:03 am, April 4th, the water spray by the concrete pumping vehicle was started, and finished at 07:19 pm.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there were no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.

- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm oh March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.
- From 2:04 pm on March 30th, water spray by the concrete pumping vehicle was started and finished at 6:33 pm on March 30th.
- Some of turbine building lights were turned on March 31st.
- From 8:28 am, April 1st, the water spray by the concrete pumping vehicle was started. At 2:14 pm, the water spray finished.
- From 5:14 pm, April 3rd, the water spray by the concrete pumping vehicle was started. At 10:16 pm, the water spray finished.

* Unit 5 and 6
- At 5:00 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool was secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection was under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* On March 21st, 23rd to April 3rd, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater around the discharge canal of the station. (We are reevaluating)

* On March 20th, 21st, 23rd to 30th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station. (We are reevaluating)

* Plutonium has been detected from the sample of soil at the site of Fukushima Daiichi Nuclear Power Station collected on 21st and 22nd of March, Concentration level of Plutonium detected was same as that of under usual environment and it was thought not to be harmful to human health. We will strengthen environmental monitoring of power station and surrounding environment.

* We detected radioactive materials contained in the puddles found in the turbine building of Unit 1 to 4.

* At approximately 3:30 pm, March 27th, we found water pooling in the vertical shaft of the trench outside of the turbine buildings for Units 1 to 3. The radiation dose at the surface of the water amounted 0.4 mSv/h in Unit 1 and over 1,000 mSv/h in Unit 2. We could not confirm the amount of the radiation dose in Unit 3. We will keep observing the condition of the water in the vertical shaft.

On March 29th, we detected niobium, tellurium, ruthenium, silver, tellurium, iodine, cesium, and ruthenium in the water collected at the trench of unit 1.
On March 30th, we took samples from the water in the trench of Unit 2 and 3, and conducted nuclide analysis on them. We are now confirming the results of the analysis.

* At approximately 9:30 am, April 2nd, we found that there was water in the shaft for storing power cable (concrete product) near the intake of water for Unit 2, the radioactive air dose was over 1,000mSv/h and the water spilled into the sea from the crack (approximately 20 cm) on the side of the shaft. We injected fresh concrete to the shaft twice, however, we could not observe a change in the amount of water flowing into the sea. Therefore, we considered that a new method of stopping the water and determined to use the polymer. Necessary equipment and experts of water shutoff will be dispatched to the site and after checking the condition, we began to stop water shutoff and were injecting polymer on April 3rd.
On April 4th, we injected the tracer from the vertical shaft of the trench to start to examine the water current. We did not observe reduction of flow or change of color or water leaking. We checked the diagram and confirmed the route. At the same time, we checked the situation of the pit in detail and considered the possibility that the water was not from the pit, rather, from the joint between the piping upstream of the pit and the duct, then the water seeped through a layer of gravel below the piping. In order to stop that seepage from the layer of gravel, we decided to conduct the water sealing to the bedrock around the piping. We arranged for the specialist and gathered equipments. On April 5th, will inject liquid glass to the bedrock.
Also, we will implement the water analysis by taking samples in the shaft near the spilling point to the sea.
In addition, from April 2nd, we will implement sampling at 15km offshore Fukushima Daiichi and Fukushima Daini Nuclear Power Stations and will evaluate these samples comprehensively.

* Since approximately 9:20 am, March 31st, the water transfer from the vertical shaft of Unit 1 to the reservoir of the centralized environmental facility was conducted. We finished the task around 11:25 am of the same day.

* We found a puddle of water at the main building of the centralized environmental facility process. We analyzed and detected approximately 1.2 x 10^1Bq/cm3 of radioactivity in full dose in the Controlled Area and 2.2 x 10^1Bq/cm3 in full dose in the Non-Controlled Area on March 29.
From April 3rd, the water level in the trench of Unit 3 increased by 15 cm. The route is not yet known, but there is a possibility that water in the turbine building of Unit 4 may be running to the trench of Unit 3. To be safe, at 09:22am, April 4th, we stopped transferring water to the turbine building of Unit 4. At this moment, the water level in the trench of Unit 3 became stable after stopping the water transfer.

* There is plenty of radioactive wastewater in the turbine buildings. Especially, Unit 2's wastewater is very highly radioactive. To store this stably, it was decided that this needed to be transferred to the Central Radioactive Waste Disposal Facility. However, within that facility, we arev storing ten thousand tons of low level radioactive wastewater. In order tov transfer more wastewater, we need to discharge the low level radioactivev wastewater. In addition, as low radioactive subsurface water is piling up in sub-drain pits of Units 5 and 6 and a part of subsurface water is running into buildings. We are concerned that important equipment to secure the safety of reactors may be submerged.
Based on the Section 1 of the Article 64 of the Nuclear Reactor Regulation Law, we have decided to discharge to the sea approximately ten thousandv tons of the accumulated low level radioactive water and a total of fifteenv hundred tons of the low level radioactive subsurface water stored in the sub drain pits of Unit 5 and 6 as soon as we get ready.
At 7:03 pm, April 4th. we started discharging the low level radioactive wastewater stored in the Central Radioactive Waste Disposal Facility to the south of the water discharge canal. By 7:10 pm, we started ten pumps.
Also, at 09:00 pm, April 4th, we started discharging the low level radioactive wastewater stored in the sub drain pits of Unit 5 and 6 by using one pump via the water discharge canal of Units 5 and 6.
We evaluate the impact on the discharge of the low radioactive wastewater to the sea as approximately 0.6 mSv per year per an adult if an adult eats adjacent fish and seaweeds everyday. The amount (0.6 mSv of effective radioactive doses per year) is one-forth of annual radioactive dose to which the general public is exposed from nature.

* The first barge of the U.S. Forces with fresh water to be used to cool down reactors etc. was towed by a ship of Maritime Self-Defense Force and docked at 3:42 pm on March 31st 2011. At approximately 3:58 pm, April 1st, we started to replenish filtrate tanks with the fresh water, and finished at 4:25 pm. At approximately 10:20 am, April 2nd, we resumed replenishing filtrate tanks with the fresh water, and finished at 4:40 pm. The second barge of the U.S. Forces with the fresh water towed by the ship of Maritime Self-Defense Force came alongside the pier at approximately 9:10 am, April 2nd. It was in preparation for replenishing filtrate

tanks with the fresh water. We began to transfer fresh water from the second barge to the first barge on April 3rd at 9:52 am and continued until 11:15 am on April 3rd.

* At 11:35 am, April 1st, a worker fell into the sea while stepping into the ship from the pier during the hose laying work of the barge. Other crew immediately rescued the worker. While no injury or contamination was confirmed, whole body counter will be implemented to check the contamination inside the body just in case.

* From 3:00 pm, April 1st, we started spraying inhibitor in order to prevent diffusion of radioactive materials. This attempt was conducted on a trial basis at the mountain side area of the common spent fuel pool in the range of 500m2. The spraying finished at 4:05 pm.

* Monitoring posts (no.1 to no.8) which were installed around the site boundary have been restored. We will continue monitoring the measured value and make announcements on those values accordingly.

* We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:
Units 1 to 4: shutdown due to the earthquake
* The national government has instructed evacuation for those local residents within 10km radius of the periphery.

* In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

* At 2:30 pm on March 30th, the power source of the residual heat removal system (B) to cool the reactor of Unit 1 was secured from an emergency power source in addition to an offsite power. This means that all the units secure backup power sources (emergency power sources) for the residual heat removal system (B).

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

* Unit 4
As it was confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

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

Kashiwazaki Kariwa Nuclear Power Station:
Units 1, 5, 6, 7: normal operation
(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]
- Hirono Thermal Power Station Units 2 and 4: shutdown due to the earthquake
- Hitachinaka Thermal Power Station Unit 1: shutdown due to the earthquake
- Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to the earthquake

[Hydro Power Station]
- Power supply has returned to normal, but facilities damaged by the earthquake are now being handled in a timely manner.

[Impacts on Transmission Facilities]
- Power supply has returned to normal, but facilities damaged by the earthquake are now being handled in a timely manner.

[Potential Implementation on Planned Rolling Blackouts and Request for Conserving Electricity Consumption]
- Considering the critical balance of our power supply capacity and expected power demand going forward, in order to avoid unexpected blackout in large areas, TEPCO has been implementing rolling blackout (planned blackout alternates from one area to another) since March 14th. We will make our utmost to secure the stable power supply as early as possible.

For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by turning of unnecessary lights and electrical equipment.

[Others]
- Please do NOT touch cut-off electric wires.
- In order to prevent fire, please make sure to switch off the electric appliances such as hair driers when you leave your house.
- For the customer who has in-house power generation, please secure fuel for generator.

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Press Releases

Press Release (Apr 05,2011)
Detection of radioactive materials from the seawater near Fukushima Daiichi Nuclear Power Station(12th release)

On March 21st 2011, radioactive materials were detected from the seawater around the discharge canal (south) of Fukushima Daiichi Nuclear Power Station which was damaged by the 2011 off the Pacific coast of Tohoku earthquake as a result of the sampling survey of radioactive materials in the seawater which was implemented as a part of monitoring of surrounding environment. We had informed the result to Nuclear and Industrial Safety Agency (NISA) and Fukushima prefecture.

(We already informed.)

We conducted a sampling survey to investigate radioactive materials expansion into the seawater around Fukushima Daiichi Nuclear Power Station from March 31st to April 3rd, 2011. We informed the detection of radioactive materials as the appendix to NISA and Fukushima Prefecture immediately.
We also informed the seawater sampling survey result which is implemented at three points within 15km area of the Fukushima Daiichi Nuclear Power Plant from April 2nd.

Three nuclides (Iodine-131, Cesium-134 and Cesium-137) are fixed figures. Other nuclides figures are to be reinvestigated by improved measures under NISA instruction on April 1st.
We are intending to conduct the same sampling investigation.

attachment1: The result of the nuclide analysis of the seawater (Mar 31) (PDF 15.8KB)
attachment2: The result of the nuclide analysis of the seawater (Apr 1) (PDF 15.7KB)
attachment3: The result of the nuclide analysis of the seawater (Apr 2) (PDF 18.4KB)
attachment4: The result of the nuclide analysis of the seawater (Apr 3) (PDF 43.8KB)
attachment5: Radioactivity Density Seawwater (Mar 31) (PDF 14.9KB)
attachment6: Radioactivity Density Seawwater (Apr 1) (PDF 14.9KB)
attachment7: Radioactivity Density Seawwater (Apr 2) (PDF 14.9KB)
attachment8: Radioactivity Density Seawwater (Apr 3) (PDF 48.9KB)

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000134

From: Abrams, Charlotte
Sent: Tuesday, April 05, 2011 11:40 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Kreuter, Jane; Mamish, Nader; Ramsey, Jack; Mitchell, Linda
Subject: RE: Phones and dosimetry badges

I believe that the phones should be returned through the ops center to the ops OIS contact. OIS brought them to the ops center before the travelers left. You may wish to check with someone in ops to see if they can give you an OIS number to call. The dosimeters should go to the desk on the second floor of OWFN – same desk where you get METRO cards.

From: Kreuter, Jane
Sent: Tuesday, April 05, 2011 11:31 AM
To: Ramsey, Jack; Abrams, Charlotte; Mamish, Nader; Mitchell, Linda
Subject: Phones and dosimetry badges

Skip is asking who is taking the phones and dosimetry badges for the travelers when they return from Japan?

Jane A. Kreuter
U.S. Nuclear Regulatory Commission
Office of International Programs
Phone: 301-415-1780
Fax: 301-415-2395
E-Mail: Jane.Kreuter@nrc.gov

QQQ | 242

From: ET02 Hoc
Sent: Wednesday, April 06, 2011 2:53 PM
To: ET07 Hoc
Subject: FW: Science Expert Call Notes - 4/5/11
Attachments: image001.jpg; Sci_Notes-040511.docx

From: ET01 Hoc
Sent: Wednesday, April 06, 2011 2:53:03 PM
To: ET02 Hoc
Subject: FW: Science Expert Call Notes - 4/5/11
Auto forwarded by a Rule

From: Sheron, Brian
Sent: Wednesday, April 06, 2011 2:53:00 PM
To: ET01 Hoc; RST01 Hoc
Subject: FW: Science Expert Call Notes - 4/5/11
Auto forwarded by a Rule

FYI.

From: Larzelere, Alex [mailto:alex.larzelere@nuclear.energy.gov]
Sent: Wednesday, April 06, 2011 2:26 PM
To: DL-NITsolutions
Subject: Science Expert Call Notes - 4/5/11

Everyone,

Here are the notes from yesterday's call.

Regards,

Alex

Alex R. Larzelere
Director, Advanced Modeling and Simulation Office
Office of Nuclear Energy (NE-71)
U.S. Department of Energy
202-586-1906
Alex.Larzelere@nuclear.energy.gov

AMSO
ADVANCED MODELING & SIMULATION OFFICE

aaa/243

Science Experts Call/April 5, 2011

Prepared by Doug Burs, INL

I. Spent Fuel Pool Assessment

1. The option of filling a spent fuel pool with borated sand in the event of a high temperature event was identified by the Industry Consortium as a discussion topic. It is not a full recommendation.
2. Filling a pool with sand would likely insulate the fuel and lead to additional fuel damage.
3. There's a possibility that escape of gaseous fission products could be reduced by addition of sand. However, it's likely that debris in the pools would prevent placing the sand uniformly enough to avoid movement of fission products.
4. Installation of high efficiency spray equipment that can get water into the pools would make more sense than sand placement.
5. The pools are designed to carry very heavy loads, so it's unlikely that the weight of sand would cause loading issues.

II. External Drywell Cooling Update

1. Additional analyses have been performed using pessimistic assumptions about heat transfer. The analyses indicate that drywell cooling might not be able to remove all decay heat.
2. Access ports through the drywell head seal are bolted open during normal operation in US plants. It's uncertain whether the access port requirement holds in Japan.
3. Piping penetrations through the drywell walls are typically sealed with epoxy. These seals could be breached if the piping sleeves were to be used to inject water.
4. There's a possibility that drilling holes through the drywell walls or cover could limit the ability to flood the drywell. If drilling was necessary, the penetrations should be placed as high as possible. Stents could potentially be used to plug any holes that were drilled.
5. It's likely that water injected into the drywell gap would flow in a narrow stream down the drywell wall and provide only limited cooling. A method for spreading the flow would be necessary.
6. Filling the gap from the bottom by injecting water into the drywell drain might be possible. This filling method would avoid the need to drill holes and overcome limitations associated with streaming of injected water.
7. Shield plugs above the drywell head have to be moved before the gates leading to the spent fuel pools can be moved. As a result, flooding the refueling cavity by opening the gates is not an option.
8. It's possible that small shape charges could be used to penetrate the drywell cover. Debris that might fall on the drywell cover after use of shape charges would probably not be heavy enough to cause significant cover damage.
9. Filling of the drywell gap may require circulation of a large volume of water that would then require treatment.

III. The Japanese government has decided to release water containing low levels of radioactivity. There are significant political consequences associated with these releases, but there may be a need for continuing to expedite release decisions in order to make room for storing more highly contaminated water. Bringing in large storage bladders is an option for to low-contaminated water storage.

From: LIA07 Hoc
Sent: Wednesday, April 06, 2011 6:27 AM
To: LIA07 Hoc; Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update - 0600 EDT, April 6, 2011
Attachments: NRC Status Update 4.06.11--0430EDT.pdf; TEPCO Press Release 276.pdf; TEPCO Press Release 275.pdf; TEPCO Press Release 277.pdf; Pages 1-5 ET Chronology 4-06-11 0600EDT.pdf; April 6 0600 EDT Brief one pager.pdf

Attached, please find updated information for the "Go Books".

The update includes:

- The 0430 EDT, 04/06/11 Status Update
- The 0600 EDT, 04/06/11 One Pager/Briefing Sheet
- The latest ET Chronology
- TEPCO Press Releases (275-277)

Please let me know if you have any questions or concerns.

-Jim

Jim Anderson
Executive Briefing Team Coordinator
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)
James.anderson@nrc.gov

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Press Releases

Press Release (Apr 06,2011)
Out flow of fluid containing radioactive materials to the ocean from areas near intake channel of Fukushima Daiichi Nuclear Power Station Unit 2 (continued report)

As a countermeasure against outflow of radioactive water into the sea near the cooling water intake at unit 2 of Fukushima Daiichi Nuclear Power Station, we have injected coagulant into the pit from April 5th and we have observed stoppage of spilling of water from the crack on the concrete lateral of the pit at 5:38 am, April 6th. (Reported on April 6th already)

Continued work from yesterday, we have put 6,000 litters of coagulant into the breakage and surrounding ground after investigation of the leakage route by putting tracer into the 9 holes drilled around electrical conduit and the pit. As at 9:30 am, we have been observing there is no leakage of water into the sea from the pit.

For the sake of completeness, we put further reinforcement for the stoppage of leakage and consider countermeasure including continuous injection of coagulant. We will also note the water level of turbine building of unit 2 remain unchanged. We will further investigate if there is any other leakage.

Facts

	Start boring	Tracer injection	Coagulant injection
No 1	April 5 18:50	April 5 14:21	April 5 15:09
No 2	April 5 14:00	April 5 14:39	April 5 15:13
No 3	April 5 17:55	April 5 18:25	April 5 18:30
No 4	April 5 17:55	April 5 19:10	April 5 19:15
No 5	April 5 20:00	April 5 20:45	April 5 22:00
No 6	April 5 21:30	April 5 21:50	April 5 22:05
No 7	April 6 0:35	April 6 1:33	April 6 2:00
No 8	April 6 0:38	April 6 1:53	April 6 2:00
No 9	April 6 5:17	Not injected	April 6 5:30

April 6, 5:38 am, Stoppage of leakage confirmed.

* pit: a shaft made of concrete

(Reference) Facts
At around 9:30 am on April 2nd, we detected water containing radiation dose over 1,000 mSv/h in the pit* where supply cables are stored near the intake channel of Unit 2. Furthermore, there was a crack about 20 cm on the concrete lateral of the pit, from where the water in the pit was out flowing. At around 12:20 pm on April 2nd, we reaffirmed the event at the scene.
We have implemented sampling of the water in the pit, together with the seawater in front of the bar screen near the pit. These samples were sent to Fukushima Daini Nuclear Power Station for analysis. (We already informed on April 2nd, 2011)

We also injected fresh concrete to the pit on April 2nd, but we could not observe a reduction in the amount of water spilling from the pit to the sea. Therefore, we started to inject the polymer (April 3rd).

From 7:08 am to 7:11 am on April 4th, we put the tracer into the pit and began an investigation of water flows. Additional tracer was put through the two new holes drilled near the pit. At 2:15 pm, April 5th, it was observed the water with tracer came out from the crack on the concrete

lateral of the pit. At 3:07 pm, April 5th, injection of coagulant from the holes was initiated. (We already informed on April 5th, 2011)

Appendix: Status of countermeasure work (PDF 44.8KB)

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Press Releases

Press Release (Apr 06,2011)
Out flow of fluid containing radioactive materials to the ocean from areas near intake channel of Fukushima Daiichi Nuclear Power Station Unit 2 (continued report)

At around 9:30 am on April 2nd, we detected water containing radiation dose over 1,000 mSv/h in the pit* where supply cables are stored near the intake channel of Unit 2. Furthermore, there was a crack about 20 cm on the concrete lateral of the pit, from where the water in the pit was out flowing. At around 12:20 pm on April 2nd, we reaffirmed the event at the scene.
We have implemented sampling of the water in the pit, together with the seawater in front of the bar screen near the pit. These samples were sent to Fukushima Daini Nuclear Power Station for analysis.
(We already informed on April 2nd, 2011)

We also injected fresh concrete to the pit on April 2nd, but we could not observe a reduction in the amount of water spilling from the pit to the sea. Therefore, we started to inject the polymer (April 3rd).

From 7:08 am to 7:11 am on April 4th, we put the tracer into the pit and began an investigation of water flows. Additional tracer was put through the two new holes drilled near the pit. At 2:15 pm, April 5th, it was observed the water with tracer came out from the crack on the concrete lateral of the pit. At 3:07 pm, April 5th, injection of coagulant from the holes was initiated.
(We already informed on April 5th, 2011)

At 5:38 am on April 6th, we observed the stoppage of the water spilling from the crack on the concrete lateral of the pit. Details of the situation will be announced after checking the blockage of the water flows.

We will continue the countermeasure in order to prevent further outflow of high level radioactive materials to the ocean.

*pit: a shaft made of concrete

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Press Releases

Press Release (Apr 06,2011)
Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, TEPCO's facilities including our nuclear power stations have been severely damaged. We deeply apologize for the anxiety and inconvenience caused.

Below is the status of TEPCO's major facilities.
*new items are underlined

[Nuclear Power Station]
Fukushima Daiichi Nuclear Power Station:
Units 1 to 3: shutdown due to the earthquake
(Units 4 to 6: outage due to regular inspections)

* The national government has instructed the public to evacuate for those local residents within 20km radius of the site periphery and to evacuate voluntarily for those local residents between 20km and 30km radius of the site periphery.

* Off-site power has been connected to Unit 1 to 6 by March 22, 2011.

* Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36 pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made. From 10:42am to 11:52am on April 3rd we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.
- At approximately 5:00 pm, March 24th, draining water from underground floor of turbine buildings into a condenser was started and it was paused at approximately 7:30 am, March 29th because we confirmed that the water level reached almost full capacity of a condenser. In order to move the water in the condenser into a condensate storage tank, water transfer from the condensate storage tank to suppression pool's water surge-tanks was conducted from around 0:00 pm, March 31st to 3:26 pm, April 2nd.
- From 1:03 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 4:04 pm.
- In order to confirm the position of water spray to the spent fuel pool by the concrete pumping vehicle, the water spray was conducted from 5:16 pm to 5:19 pm.
- Some of turbine building lights were turned on April 2nd.
- The water transfer from the condenser to the condensate storage tank has been implemented since 1:55 pm, April 3rd.
- As it is suspected that hydrogen gas is accumulated inside reactor containment vessel, we are considering injection of nitrogen gas inside the vessel.

* Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function).

At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there was a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4:00 pm to 5:00 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 6:31pm, March 27th, transfer from the fire fighting pump to a temporary motor driven pump was made. From 10:22am to 0:06pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 12:19 pm, March 25th. From 4:30 pm, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th. At 9:25 am, March 30th, we started fresh water injection by a temporary motor driven pump, but we switched the pump to the fire fighting pump due to the pump trouble. At 1:10 pm, March 30th, freshwater injection was suspended, because we found the crack on a part of the hose. At 7:05 pm, March 30th, freshwater injection was resumed and finished at 11:50 pm, March 31.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.
- At approximately 4:45 pm, March 29th, the water in a condensate storage tank was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to a condensate storage tank in order to drain water on the underground floor of the turbine building into a condenser. At 11:50 am, April 1st, transfer was completed.
- At 2:56 pm, April 1st, water injection into spent fuel pool in Unit 2 by temporary motor driven pump was initiated. At 5:05 pm on April 1st, the water injection was finished.
- The water transfer from the condenser to the condensate storage tank has been implemented since 5:10 pm, April 2nd.
- Some of turbine building lights were turned on April 2nd.
- At 11:05 am, April 4th, water injection into spent fuel pool in Unit 2 by a temporary motor driven pump was initiated. At 1:37 pm, April 4th, the water injection was finished.

* Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in the Article 15, the Clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it was not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.

- Before 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21st, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it was slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 pm on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At approximately 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water was switched to temporary electricity pumps from the fire engine pumps. From 10:03am to 0:16pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
- At approximately 12:34pm March 27th, the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th, the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.
- At approximately 5:40 pm, March 28th, the water in a condensate storage tank was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to a condensate storage tank in order to drain water on the underground floor of the turbine building into a condenser. We finished the transfer work at approximately 8:40 am, March 31st.
- From 4:30 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 7:33 pm.
- From 9:52 am, April 2nd, the water spray by the concrete pumping vehicle was started, and finished at 0:54 pm.
- Some of turbine building lights were turned on April 2nd.
- From 5:03 am, April 4th, the water spray by the concrete pumping vehicle was started, and finished at 07:19 pm.

* Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there were no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.

- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.
- From 2:04 pm on March 30th, water spray by the concrete pumping vehicle was started and finished at 6:33 pm on March 30th.
- Some of turbine building lights were turned on March 31st.
- From 8:28 am, April 1st, the water spray by the concrete pumping vehicle was started. At 2:14 pm, the water spray finished.
- From 5:14 pm, April 3rd, the water spray by the concrete pumping vehicle was started. At 10:16 pm, the water spray finished.
- From 5:35 pm, April 5th, the water spray by the concrete pumping vehicle was started. At 6:22 pm, the water spray finished.

* Unit 5 and 6
- At 5:00 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

* On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool was secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
  * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

* On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection was under preparation.
  * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* On March 21st, 23rd to April 4th we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater around the discharge canal of the station. (We are reevaluating)

* On March 20th, 21st, 23rd to 30th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station. (We are reevaluating)

* Plutonium has been detected from the sample of soil at the site of Fukushima Daiichi Nuclear Power Station collected on 21st and 22nd of March, Concentration level of Plutonium detected was same as that of under usual environment and it was thought not to be harmful to human health. We will strengthen environmental monitoring of power station and surrounding environment.

* We detected radioactive materials contained in the puddles found in the turbine building of Unit 1 to 4.

* At approximately 3:30 pm, March 27th, we found water pooling in the vertical shaft of the trench outside of the turbine buildings for Units 1 to 3. The radiation dose at the surface of the water amounted 0.4 mSv/h in Unit 1 and over 1,000mSv/h in Unit 2. We could not confirm the amount

of the radiation dose in Unit 3. We will keep observing the condition of the water in the vertical shaft.
On March 29th, we detected niobium, tellurium, ruthenium, silver, tellurium, iodine, cesium, and ruthenium in the water collected at the trench of unit 1.
On March 30th, we took samples from the water in the trench of Unit 2 and 3, and conducted nuclide analysis on them. We are now confirming the results of the analysis.

* At approximately 9:30 am, April 2nd, we found that there was water in the shaft for storing power cable (concrete product) near the intake of water for Unit 2, the radioactive air dose was over 1,000mSv/h and the water spilled into the sea from the crack (approximately 20 cm) on the side of the shaft. We injected fresh concrete to the shaft twice, however, we could not observe a change in the amount of water flowing into the sea. Therefore, we considered that a new method of stopping the water and determined to use the polymer. Necessary equipment and experts of water shutoff will be dispatched to the site and after checking the condition, we began to stop water shutoff and were injecting polymer on April 3rd.
On April 4th, we injected the tracer from the vertical shaft of the trench to start to examine the water current. We did not observe reduction of flow or change of color or water leaking. We checked the diagram and confirmed the route. At the same time, we checked the situation of the pit in detail and considered the possibility that the water was not from the pit, rather, from the joint between the piping upstream of the pit and the duct, then the water seeped through a layer of gravel below the piping. In order to stop that seepage from the layer of gravel, we decided to conduct the water sealing to the bedrock around the piping. We arranged for the specialist and gathered equipments. On April 5th, liquid glass was injected to the bedrock. Tracer was put through the two new holes drilled near the pit to investigate the water flow. At 2:15 pm, April 5th, it was observed the water with tracer came out from the crack on the concrete lateral of the pit. At 3:7 pm, April 5th, injection of coagulant from the holes was initiated and we have confirmed the outflow from the crack on the concrete lateral of the pit has stopped at 5:38 am, April 6th. We confirmed water level has not been rising in the turbine building of unit 2. Additional countermeasure to prevent discharge of radioactive material from the pit will be implemented. Iodine and Cesium were detected from the water sampled in the pit and in the sea near the water discharge. Additional nuclide analysis will be implemented.
In addition, from April 2nd, we will implement sampling at 15km offshore Fukushima Daiichi and Fukushima Daini Nuclear Power Stations and will evaluate these samples comprehensively.

* Since approximately 9:20 am, March 31st, the water transfer from the vertical shaft of Unit 1 to the reservoir of the centralized environmental facility was conducted. We finished the task around 11:25 am of the same day.

* We found a puddle of water at the main building of the centralized environmental facility process. We analyzed and detected approximately 1.2×10^{1}Bq/cm3 of radioactivity in full dose in the Controlled Area and 2.2×10^{1}Bq/cm3 in full dose in the Non-Controlled Area on March 29.
From April 3rd, the water level in the trench of Unit 3 increased by 15 cm. The route is not yet known, but there is a possibility that water in the turbine building of Unit 4 may be running to the trench of Unit 3. To be safe, at 09:22am, April 4th, we stopped transferring water to the turbine building of Unit 4. At this moment, the water level in the trench of Unit 3 became stable after stopping the water transfer.

* There is plenty of radioactive wastewater in the turbine buildings. Especially, Unit 2's wastewater is very highly radioactive. To store this stably, it was decided that this needed to be transferred to the Central Radioactive Waste Disposal Facility. However, within that facility, we are storing ten thousand tons of low level radioactive wastewater. In order to transfer more wastewater, we need to discharge the low level radioactive wastewater. In addition, as low radioactive subsurface water is piling up in sub-drain pits of Units 5 and 6 and a part of subsurface water is running into buildings. We are concerned that important equipment to secure the safety of reactors may be submerged.
Based on the Section 1 of the Article 64 of the Nuclear Reactor Regulation Law, we have decided to discharge to the sea approximately ten thousand tons of the accumulated low level radioactive water and a total of fifteen hundred tons of the low level radioactive subsurface water stored in the sub drain pits of Unit 5 and 6 as soon as we get ready.
At 7:03 pm, April 4th. we started discharging the low level radioactive wastewater stored in the Central Radioactive Waste Disposal Facility to the south of the water discharge canal. By 7:10 pm, we started ten pumps.
Also, at 09:00 pm, April 4th, we started discharging the low level radioactive wastewater stored in the sub drain pits of Unit 5 and 6 by using one pump via the water discharge canal of Units 5 and 6.
We evaluate the impact on the discharge of the low radioactive wastewater to the sea as approximately 0.6 mSv per year per an adult if an adult eats adjacent fish and seaweeds everyday. The amount (0.6 mSv of effective radioactive doses per year) is one-forth of annual radioactive dose to which the general public is exposed from nature.

* The first barge of the U.S. Forces with fresh water to be used to cool down reactors etc. was towed by a ship of Maritime Self-Defense Force and docked at 3:42 pm on March 31st 2011. At approximately 3:58 pm, April 1st, we started to replenish filtrate tanks with the fresh water, and finished at 4:25 pm. At approximately 10:20 am, April 2nd, we resumed replenishing filtrate tanks with the fresh water, and finished at 4:40 pm. The second barge of the U.S. Forces with the fresh water towed by the ship of Maritime Self-Defense Force came alongside the pier at approximately 9:10 am, April 2nd. It was in preparation for replenishing filtrate tanks with the fresh water. We began to transfer fresh water from the second barge to the first barge on April 3rd at 9:52 am and continued until 11:15 am on April 3rd.

* At 11:35 am, April 1st, a worker fell into the sea while stepping into the ship from the pier during the hose laying work of the barge. Other crew immediately rescued the worker. While no injury or contamination was confirmed, whole body counter has been implementing to check the contamination inside the body just in case.

* From 3:00 pm, April 1st, we started spraying inhibitor in order to prevent diffusion of radioactive materials. This attempt was conducted on a trial basis at the mountain side area of the common spent fuel pool in the range of 500m^2. The spraying finished at 4:05 pm.

* Monitoring posts (no.1 to no.8) which were installed around the site boundary have been restored. We will continue monitoring the measured value and make announcements on those values accordingly.

* We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:
Units 1 to 4: shutdown due to the earthquake
* The national government has instructed evacuation for those local residents within 10km radius of the periphery.

* In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

* At 2:30 pm on March 30th, the power source of the residual heat removal system (B) to cool the reactor of Unit 1 was secured from an emergency power source in addition to an offsite power. This means that all the units secure backup power sources (emergency power sources) for the residual heat removal system (B).

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

* Unit 4
As it was confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

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

Kashiwazaki Kariwa Nuclear Power Station:
Units 1, 5, 6, 7: normal operation
(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]
- Hirono Thermal Power Station Units 2 and 4: shutdown due to the earthquake
- Hitachinaka Thermal Power Station Unit 1: shutdown due to the earthquake
- Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to the earthquake

[Hydro Power Station]
- Power supply has returned to normal, but facilities damaged by the earthquake are now being handled in a timely manner.

[Impacts on Transmission Facilities]
- Power supply has returned to normal, but facilities damaged by the earthquake are now being handled in a timely manner.

[Potential Implementation on Planned Rolling Blackouts and Request for Conserving Electricity Consumption]
- Considering the critical balance of our power supply capacity and expected power demand going forward, in order to avoid unexpected blackout in large areas, TEPCO has been implementing rolling blackout (planned blackout alternates from one area to another) since March 14th. We will make our utmost to secure the stable power supply as early as possible. For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by turning of unnecessary lights and electrical equipment.

[Others]
- Please do NOT touch cut-off electric wires.
- In order to prevent fire, please make sure to switch off the electric appliances such as hair driers when you leave your house.
- For the customer who has in-house power generation, please secure fuel for generator.

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From: RST03 Hoc
Sent: Wednesday, April 06, 2011 2:13 PM
To: RST01 Hoc
Subject: FW: Unit 2 Severe Accident Progression Scenario.doc
Attachments: Unit 2 Severe Accident Progression Scenario.doc

Follow Up Flag: Follow up
Flag Status: Flagged

RST assessment of unit 2

From: RST09 Hoc
Sent: Tuesday, March 29, 2011 11:55 PM
To: RST01 Hoc
Subject: Unit 2 Severe Accident Progression Scenario.doc

QQQ 1245

Unit 2 Severe Accident Progression Scenario

The water level in the reactor pressure vessel (RPV) began to drop at about 8:00 on March 14th.The RPV pressure also began to rise at that time. The top of active fuel (TAF) was uncovered at 16:20 and sea water injection was started at 16:34. At 18:06, a safety valve was opened and the RPV pressure dropped steadily until 20:03. By then, the water level had dropped to about 4 m below the TAF. Three steam spikes, caused by hot core occurred, starting at 20:37 and 22:50 on 3/14, and 0:08 on 3/15, respectively. The second of these was the most energetic, resulting in a pressure rise in the RPV to 3150 kPa at 23:30. After the third spike, the RPV and DW pressures become equal at about 730 kPa, implying a vessel breach shortly after the third pressure spike.

Starting at about 21:20 on 3/14, the drywell pressure started to increase from 418 kPa, reaching 750 kPa by 23:54. The pressure remained close to this value until about 7:20 on 3/15, after which it rapidly dropped to 275 kPa by 15:50. The RPV and DW pressures tracked each other from about 23:45 on 3/14 to 7:20 on 3/15. The wetwell pressure was fairly constant at about 300-330 kPa during this period.

It was reported that, at 6:10 on 3/15, an abnormal sound was heard in the reactor building near the suppression pool. This could have been due to drywell failure, or possibly a large hydrogen burn in the reactor building. Pressure readings in the wetwell ceased by 7:20.

The pressure in the DW and RPV slowly dropped to about 220 kPa by 5:35 on 3/16. The pressure then suddenly increased to 450kPa by 6:55, signaling a second breach of the RPV followed by rapid steaming from sea water falling on to the core debris. It is possible that core debris-concrete interactions could have occurred during the early portion of this quenching. The DW pressure then dropped to about 100-140 kPa, and remains fairly steady in this range.

From: Brandon, Lou
Sent: Wednesday, April 06, 2011 5:33 AM
To: PMT03 Hoc; Hoc, PMT12
Subject: draft 2 - reduced PMT staffing
Attachments: japan Incident - Draft Reduced Staffing Plan for Protective Measures Team.docx

000246

Proposed Reduced Staffing Plan for Protective Measures Team (PMT)

Tentative start date: 4/10/2011

NRC's (and PMT's) Top Priorities

1) Continued assessment of radiological conditions, dose projections, and protective action recommendations. Currently, the NRC Japan Team reports that no PMT additional support or actions are being requested (offsite radiological assessments, RASCAL source term updates).

2) Providing technical assistance to the US Ambassador in Japan and the Japanese Government, including a particular focus on the Unit 1 drywell and the Unit 3 and 4 spent fuel pools.

3) Coordination with other US Departments and Agencies, the Institute of Nuclear Power Operations(INPO), Bechtel, General Electric Hitachi (GEH), Tokyo Electric Power Company (TEPCO), and the Japanese military.

PMT Roles and Responsibilities

Support Site Team: During the Japan day shift the PMT communicates and coordinates with the Site Team on all protective measures issues, which includes support for the Japanese Ambassador.

Communicates with other agencies: The PMT reviews radiological measurement and sample data. It reviews protective action recommendations, impacted areas, and related health effect issues and perspectives, and coordinates with DOE, EPA, the Advisory Team, and other federal agencies.

Justification for the proposed staffing below:

Day Shift (7am-3pm) - This period is the most demanding in terms of Executive Team requests, bridge line communications with other agencies, and follow up from other shifts when normal communications are not always practical. Two dose assessors are necessary for optimum quality control. As staffing transitions toward minimums, reductions are practical.

Afternoon Shift (3pm-11pm) – This shift requires less support since it is active after normal working hours. A PAAD, a RAAD, and a dose assessor may meet the need. The last four hours overlaps with the Japan Team day shift.

Night Shift (11pm-7am) – This shift requires the least support since there are few interagency calls other than supporting the Japan Team. The 1st four hours overlap the Japan Team day shift. This shift may be able to be entirely eliminated in the near future.

Schedule main Japan Team communications with HQ PMT during their morning

Weekdays	US comms	Japan Team	
Japan Time:		4am-12pm	
EST:	7am-3pm	3pm-11pm	11pm-7am
Director	X	X	
RAAD	X	X	X
PAAD	X	X	X
Dose As1	X	X	X
Dose AS2	X		
Coordinator	X		

Weekends	US comms	Japan Team	
Japan Time:		4am-12pm	
EST:	7am-3pm	3pm-11pm	11pm-7am
Director	X	X	
RAAD	X	X	X
PAAD	X	X	X
Dose As1	X	X	X
Dose AS2			
Coordinator			

Comments from 4/5/2011 PMT Day Shift:

Lou:
The day shift took a look at the proposed schedule and had the following comments:

- The Director position is important for Coordination with ET. The PMT needs leadership and interface with the ET. However:
    - The Director and PAAD could share combined duties and the Coordinator and PAAD could share combined duties; i..e.,
    - Collapse 3 people (Director, PAAD, and Coordinator) to 2 people
- Senior PAADs (e.g., Kathy Brock, Greg Casto) with experience could be in Director position. Current Director's could help in suggesting staff for combined Director/PAAD role.
    - Suggested only for 11P-7A shift
- On back shift, collapse 3 people (RAAD & 2 dose assessors) to two people (RAAD & 1 Dose Assessor)
    - RAAD needs to have Dose Assessor experience to be able to QC any back shift Rascal runs

If you have any questions on these comments please let me know.
Thanks,
Duane

From: LIA07 Hoc
Sent: Wednesday, April 06, 2011 6:11 PM
To: Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update - 1800 EDT, April 6, 2011
Attachments: Pages 1-5 from ET Chronology 4-06-11 1800EDT.PDF; TEPCO Press Release 284.pdf; TEPCO Press Release 278.pdf; TEPCO Press Release 279.pdf; TEPCO Press Release 280.pdf; TEPCO Press Release 281.pdf; TEPCO Press Release 282.pdf; TEPCO Press Release 283.pdf; TEPCO Press Release 285.pdf; TEPCO Press Release 286.pdf; TEPCO Press Release 287.pdf; USNRC Earthquake-Tsunami Update.040611.1800EDT.pdf

Attached, please find updated information for the "Go Books".

The updates include:

- The 1800 EDT, 04/06/11 Status Update
- The latest ET Chronology
- The latest "One Pager" (1500 EDT, 04/06/11)
- TEPCO Press Releases (278-287)

Please let me know if you have any questions or concerns.

-Sara

Sara Mroz
Communications and Outreach
Office of Nuclear Security & Incident Response
US Nuclear Regulatory Commission
Sara.Mroz@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

0266/247

Press Releases

Press Release (Apr 06,2011)
Detection of radioactive material in the soil in Fukushima Daiichi Nuclear Power Station (continued report)

As part of monitoring activity of the surrounding environment, we conducted analysis of plutonium contained in the soil collected on March 21st and 22nd at the 5 spots in Fukushima Daiichi Nuclear Power Station. As a result, plutonium 238, 239 and 240 were detected.
(previously announced)

Subsequently, from the 3 spots where periodic sampling was conducted on March 25th and 28th and from another spot which was supplemented on 25th, we conducted analysis of plutonium contained in the soil. As a result, plutonium 238, 239 and 240 were detected.

In addition, we conducted nuclide analysis of gamma ray contained in the soil collected on March 21st and 22nd at the 5 spots in Fukushima Daiichi Nuclear Power Station. Such analysis was also conducted on soil collected on March 25th and 28th at the 4 spots. As a result, radioactive materials were detected as described in the exhibit. Accordingly, we have reported the result of analysis to Nuclear and Industrial Safety Agency and Fukushima Prefecture.

We will continue the radionuclide analysis contained in the soil.

Appendix1: Result of Plutonium measurement in the soil in Fukushima Daiichi Nuclear Power Plant(PDF 13.0KB)
Appendix2: Result of gamma ray nuclide analysis of soil(PDF 35.4KB)

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Press Releases

Press Release (Apr 06,2011)
Implementation Plan of Rolling Blackouts on and after April 7, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since March 14 (Mon). We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after April 7, 2011 as follows:

o Implementation plan of rolling blackout from April 7 (Thu) to April 10 (Sun)
On April 7 (Thu), no rolling blackout will be implemented in any time periods or any regional groups based on today's power demand, weather forecast and trend of power demand for tomorrow.
Also from April 8 (Fri) to April 10 (Sun), no rolling blackout will be implemented in any time periods or any regional groups based on recent trend of power demand and supply.
We thank you for your cooperation on conserving electricity, which enabled us to avoid rolling blackout from tomorrow until April 10.

o Implementation plan of rolling blackouts from April 11 (Mon) to April 13 (Wed)
Please refer to the appendix for details.

- The actual blackout period for each Group is planned to be up to approximately 3 hours during the relevant scheduled time period.
- Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- A blackout may occur in the adjacent areas where the planned blackouts are carried out.

[Others]
- In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

<Reference>
o Prediction of demand and supply from April 6 (Wed) to April 10 (Sun)

(MW)

	April 6	April 7	April 8	April 9	April 10
Estimated Demand	33,500	33,000	33,500	33,500	31,500
Supply Capacity	40,500	39,500	40,500	40,000	40,500

* Prediction of demand
- April 7: Since the temperature is forecasted to be higher than today, we assume the peak demand to be 33,000MW, which is lower than today.
- April 8: The temperature is forecasted to be similar to April 7, however, the weather may be slightly worse, therefore we assume the peak demand to be 33,500MW.
- April 9: Though the weather may turn bad, since it is a Saturday, we assume the peak demand to be 33,500MW, which is similar to April 8.
- April 10: The temperature will be higher than April 9 and since it is a Sunday, we assume the peak demand to be 31,500MW, which is lower than April 9.

* Estimated demand and supply capacity may change depending on the situation of the day.

Appendix: Weekly Rolling Blackout Tentative Plan from April 7(Thu)to April 13(Wed) (PDF 16.4KB)

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Press Releases

Press Release (Apr 06,2011)
Regarding a letter of protest from National Federation of Fisheries Cooperative Associations

Today we have received a letter of protest from National Federation of Fisheries Cooperative Associations (NFFCA) with regard to the discharge of the low level radioactive wastewater from Fukushima Daiichi Nuclear Power Station to the sea. We, as the operator of the power station, received the letter with sincerity, being painfully aware of the feelings and concerns of people in the fishery industry.

While the water discharge was an unavoidable emergency measure implemented after the consultation with the national government in order to prevent the spread of high level radioactive substances, protect the essential safety facilities from inundation and maintain the cooling functions of Units 5 and 6, we would like to make our deepest apologies for the concerns and anxieties caused by our insufficient explanation in advance.

With regard to the compensations related to the water discharge and other issues, we will follow the Act on Compensation for Nuclear Damages and sincerely address them with support from the government. We would highly appreciate it if NFFCA could understand the above.

Working closely with the government, we will make every effort toward the earliest resolution of the situation.

April 6, 2011
The Tokyo Electric Power Company, Incorporated
Tsunehisa Katsumata
Chairman

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Press Releases

Press Release (Apr 06,2011)
Out flow of fluid containing radioactive materials to the ocean from areas near intake canal of Fukushima Daiichi Nuclear Power Station Unit 2 (continued report 2)

At around 9:30 am on April 2nd, we detected water containing radiation dose over 1,000 mSv/h in the pit* where supply cables are stored near the intake channel of Unit 2. Furthermore, there was a crack about 20 cm on the concrete lateral of the pit, from where the water in the pit was out flowing. At around 12:20 pm on April 2nd, we reaffirmed the event at the scene.
We have implemented sampling of the water in the pit, together with the seawater in front of the bar screen near the pit. These samples were sent to Fukushima Daini Nuclear Power Station for analysis. (Reported on April 2nd already)

Today at 5:38 am, we have observed stoppage of spilling of water from the crack on the concrete lateral of the pit. For the sake of completeness, we put further reinforcement for the stoppage of leakage and consider countermeasure including continuous injection of coagulant. We will also note the water level of turbine building of unit 2 remain unchanged. We will further investigate if there is any other leakage. (Reported on April 6th already)

We have been conducting sampling of seawater in front of the bar screen near the pit. In regard to the sample collected yesterday (April 5th), as a result of conducting nuclide analysis, radioactive materials were detected as described in the exhibit. Accordingly, we have reported the result of analysis to Nuclear and Industrial Safety Agency and Fukushima Prefecture.

Regarding the results on three nuclides (iodine 131, cesium 134, cesium 137), we would like to assume those as definite result, however, as for other nuclides, we will revaluate in accordance with the preventive measures formulated after being given warning from Nuclear and Industrial Safety Agency on April 1st.

* pit: a shaft made of concrete

Appendix:Results of nuclide analysis on seawater sampled in front of quay and screens of Unit 2/4(PDF 9.88KB)
Appendix:Radioactivity density of seawater near the quay of Fukushima Daiichi Nuclear Power Station (PDF 12.2KB)

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Press Releases

Press Release (Apr 06,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 4:00 pm April 6th)

On March 11th 2011, turbines and reactors of Fukushima Daini Nuclear Power Station Unit 1 to 4 (Boiling Water Reactor, rated output 1100 Megawatts) that had been operating at rated power automatically shutdown at 2:48 pm due to the Tohoku-Chihou-Taiheiyou-Oki Earthquake (previously announced on March 11th).

At 7:15 pm on March 15th, the reactor of Unit 4 achieved cold shutdown. As a result, all reactors of Unit 1 to 4 at Fukushima Daini Nuclear Power Station achieved cold shutdown (previously announced on March 15th).

As of 4:00 pm on April 6th, the reactors of Unit 1 to 4 are in cold shutdown (please refer to the attachment). We continue to make our endeavor to stabilize each plant.

appendix:TEPCO Plant Status of Fukushima Daini Nuclear Power Station (as of 4:00 pm April 6th)(PDF 17.1KB)

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Press Releases

Press Release (Apr 06,2011)
Detection of radioactive materials from the seawater near Fukushima Daiichi Nuclear Power Station

On March 21st 2011, a sampling survey, conducted as a part of monitoring of surrounding environment, detected radioactive materials in the seawater around the discharge canal (south) of Fukushima Daiichi Nuclear Power Station which was damaged by the Tohoku-Taiheiyou-Oki Earthquake. Therefore, we informed the result to Nuclear and Industrial Safety Agency (NISA) and Fukushima prefecture.

We have also informed NISA on the results of seawater sampling survey which has been implemented since April 2nd at three different points within 15km area of the Fukushima Daiichi Nuclear Power Plant.

The data of three nuclides (Iodine-131, Cesium-134 and Cesium-137) will be reported as fixed data. Other nuclides figures are to be reinvestigated by improved measures under NISA instruction on April 1st.
(We already informed.)

On April 5th, 2011 we conducted sampling survey to evaluate the spread of the radioactive substances which were detected at Fukushima Daiichi Nuclear Power Station. Since the survey detected radioactive substances as shown in appendix, we informed NISA and Fukushima Prefecture about the result.

Also, we added 3 additional sampling points within 15km area (6 points in total) yesterday, and we informed NISA and Fukushima about those results today.

We are intending to conduct the same sampling investigation.

Appendix1: The result of the nuclide analysis of the seawater(Around the discharge canal (north) of Unit 5 and 6 Fukushima Daiichi Nuclear Power Station)(PDF 12.1KB)
Appendix2: The result of the nuclide analysis of the seawater(Around the discharge canal (south) of Fukushima Daiichi Nuclear Power Station)(PDF 12.1KB)
Appendix3: The result of the nuclide analysis of the seawater(Around the north water discharge canal of Fukushima Daini Nuclear Power Station (around Units 3 and 4))(PDF 10.3KB)
Appendix4: The result of the nuclide analysis of the seawater(Around Iwasawa shore at Fukushima Daini Nuclear Power Station)
(PDF 10.3KB)
Appendix5: The result of the nuclide analysis of the seawater(Around 15km off shore of Fukushima Daiichi Nuclear Power Station)(PDF 12.0KB)
Appendix6: The result of the nuclide analysis of the seawater(Around 15km off shore of Fukushima Daini Nuclear Power Station)(PDF 11.9KB)
Appendix7: The result of the nuclide analysis of the seawater(Around 15km off shore from Iwasawa Sea Shore)(PDF 11.8KB)
Appendix8: The result of the nuclide analysis of the seawater(Around 15km off shore from Hirono Town)(PDF 10.2KB)
Appendix9: The result of the nuclide analysis of the seawater(Around 15km off shore from Minami-Soma City)(PDF 10.2KB)
Appendix10: The result of the nuclide analysis of the seawater(Around 15km off shore from Ukedogawa River)(PDF 10.2KB)
Appendix11: Samples are examined at Fukushima Daini Nuclear Power Station
(PDF 46.9KB)
Appendix12: Radioactivity Density of Seawater(PDF 35.1KB)

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Press Releases

Press Release (Apr 06,2011)
Plant Status of Fukushima Daiichi Nuclear Power Station (as of 8:00 pm, April 6)

*Updates are underlined

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1 (Shut down)
-Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm on March 12th. It was assumed to be hydrogen explosion.
-At approximately 2:30 am on March 23rd, seawater injection to the nuclear reactor through the feed water system was initiated.
-We had been injecting seawater into the reactor, but from 3:37 pm on March 25th, we started injecting freshwater.
-Some of turbine building lights were turned on April 2nd.
-We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:42am to 11:52am on April 3rd we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
-As it is suspected that hydrogen gas is accumulated inside reactor containment vessel, we are considering injection of nitrogen gas inside the vessel.

Unit 2 (Shut down)
-At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within the chamber decreased.
-We have been injecting seawater into the reactor, but from 10:10 am on March 26th, we started injecting freshwater (with boric acid).
-Some of turbine building lights were turned on April 2nd.
-We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:22am to 0:06pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.

Unit 3 (Shut down)
-Explosive sound and white smoke were confirmed at 11:01am March 14th. It was assumed to be hydrogen explosion.
-We had been injecting seawater into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting freshwater.
-Some of turbine building lights were turned on April 2nd.
-We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:03am to 0:16pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.

Unit 4 (outage due to regular inspection)
-At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
-Some of turbine building lights were turned on March 31st.
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 5 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
-At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown. At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically. At around 4:14 pm, March 24th we replaced the pump, and restarted cooling

of reactor at around 4:35 pm.
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 6 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
-At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
-In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Operation for cooling the spent fuel pools
-We will conduct further water spray depending on the conditions of spent fuel pools.

Draining water from underground floor of turbine buildings
-At 1:55 pm April 3rd, in Unit 1, water transfer from a condensate storage tank to a suppression pool water surge-tank was initiated.
-At 5:10 pm, April 2nd, in Unit 2, water transfer from a condensate storage tank was to a suppression pool water surge-tank was initiated.

Others
-We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.
· Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
· Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
· Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
· Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
· Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
· Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
· Determined at 9:37 pm Mar 14th (Around main entrance)
· Determined at 6:51 am Mar 15th (Around main entrance)
· Determined at 8:11 am Mar 15th (Around main entrance)
· Determined at 4:17 pm Mar 15th (Around main entrance)
· Determined at 11:05 pm Mar 15th (Around main entrance)
· Determined at 8:58 am Mar 19th (Around MP5)
From now on, if the measured figure fluctuates and goes above and below 500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly abnormal figure and it is evident that the event is not the continuous same event, we will determine and notify.

-The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
-In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.
*: Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
-By March 22nd, Units 1 through 6 started to be energized from the external power source.
-At around 11:35 am April 1st, a worker fell into the sea when he got into a barge of the U.S. Forces to repair a hose of the ship. The worker was rescued immediately, and was not injured and not contaminated. The worker will be checked using the whole-body counter to ensure his health.
-From April 2nd, we began to transfer the radioactive water we collected from the Central Environmental Facility to the Unit 4 turbine building. On April 4th, water level of the pit in the trench of Unit 3 increased by 15cm from previous day. Pathway of water flow is unknown. We can not deny the possibility that water in the turbine building of Unit 4 flows into the trench of Unit 3. So, we stopped transferring water to the Unit 4 turbine building to make assurance. Present water level of the pit in the trench of Unit 3 is not changed from the time we stopped transferring, and is being stable.
-As a countermeasure against outflow of radioactive water into the sea near the cooling water intake at unit 2 of Fukushima Daiichi Nuclear

Power Station, we have injected coagulant into the pit from April 5th and we have observed stoppage of spilling of water from the crack on the concrete lateral of the pit at 5:38 am, April 6th.
-Continued work from yesterday, we have put 6,000 litters of coagulant into the breakage and surrounding ground after investigation of the leakage route by putting tracer into the 9 holes drilled around electrical conduit and the pit. As at 9:30 am, we have been observing there is no leakage of water into the sea from the pit.
-For the sake of completeness, we put further reinforcement for the stoppage of leakage and consider countermeasure including continuous injection of coagulant. We will also note the water level of turbine building of unit 2 remain unchanged. We will further investigate if there is any other leakage.
(Previously announced on April 6th)
On April 6th, we installed rubber boards as a countermeasure against outflow from the intake. We will further investigate if there is any other leakage.
-There is plenty of radioactive wastewater in the turbine buildings. Especially, Unit 2's wastewater is very highly radioactive. To store this stably, it was decided that this needed to be transferred to the Central Radioactive Waste Disposal Facility. However, within that facility, we are storing ten thousand tons of low level radioactive wastewater. In order to transfer more wastewater, we need to discharge the low level radioactive wastewater. In addition, as low radioactive subsurface water is piling up in sub-drain pits of Units 5 and 6 and a part of subsurface water is running into buildings. We are concerned that important equipment to secure the safety of reactors may be submerged. Based on the Section 1 of the Article 64 of the Nuclear Reactor Regulation Law, we have decided to discharge to the sea approximately ten thousand tons of the accumulated low level radioactive water and a total of fifteen hundred tons of the low level radioactive subsurface water stored in the sub drain pits of Unit 5 and 6 as soon as we get ready.
-We evaluate the impact on the discharge of the low radioactive wastewater to the sea as approximately 0.6 mSv per year per an adult if an adult eats adjacent fish and seaweeds everyday. The amount (0.6mSv of effective radioactive doses per year) is one-forth of annual radioactive dose to which the general public is exposed from nature.
(Previously announced on April 4th)
-At 7:03 pm, April 4th, discharge of low radioactive wastewater (approximately 10,000 ton in total) from Central Radioactive Waste Disposal Facility to the sea was initiated.
-At 9:00 pm, April 4th, discharge of low radioactive subsurface water (1,500 ton in total) from sub-drain pits of Units 5 and 6 to the sea was initiated.
-From 3:00 pm to 4:30 pm, April 5th, in order to prevent diffusion of radioactive contaminated water out from the site port facility to breakwater area which is south to the power station, we began repair of breakwater by founding the large sandbag around it to replace damaged steel water bar. We will continue the operation to prevent diffusion.
-We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

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Press Releases

Press Release (Apr 06,2011)
Injection of nitrogen to reactor containment vessel of Fukushima Daiichi Nuclear Power Station Unit 1

Regarding Fukushima Daiichi Nuclear Power Station Unit 1, taking into account the possibility of hydrogen accumulating inside, we have been considering encapsulation of hydrogen by injecting nitrogen to the reactor containment vessel.

Today, we received an order from minister of economy, trade and industry to report on matter such as necessity of encapsulating nitrogen, method for implementation, and impact assessment of safety. Accordingly, we have compiled related matters and reported to minister of economy, trade and industry today. The report was approved after the deliberation in the Ministry of Economy, Trade and Industry.

Base on the report, we will begin injecting nitrogen to the reactor containment vessel of Unit 1 today, around 10:30pm.

Appendix1: Necessity for injecting nitrogen(PDF 11.1KB)
Appendix2: Schematic Diagram Regarding Injection of Nitrogen Gas into the PCV(PDF 17.9KB)

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Press Releases

Press Release (Apr 06,2011)
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*Updates are underlined

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Unit 1 (Shut down)
-Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm on March 12th. It was assumed to be hydrogen explosion.
-At approximately 2:30 am on March 23rd, seawater injection to the nuclear reactor through the feed water system was initiated.
-We had been injecting seawater into the reactor, but from 3:37 pm on March 25th, we started injecting freshwater.
-Some of turbine building lights were turned on April 2nd.
-We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:42am to 11:52am on April 3rd we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.
-As it is suspected that hydrogen gas is accumulated inside reactor containment vessel, we are considering injection of nitrogen gas inside the vessel.

Unit 2 (Shut down)
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-We will conduct further water spray depending on the conditions of spent fuel pools.

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-For the sake of completeness, we put further reinforcement for the stoppage of leakage and consider countermeasure including continuous injection of coagulant. We will also note the water level of turbine building of unit 2 remain unchanged. We will further investigate if there is any other leakage.
(Previously announced on April 6th)
-There is plenty of radioactive wastewater in the turbine buildings. Especially, Unit 2's wastewater is very highly radioactive. To store this stably, it was decided that this needed to be transferred to the Central Radioactive Waste Disposal Facility. However, within that facility, we are storing ten thousand tons of low level radioactive wastewater. In order to transfer more wastewater, we need to discharge the low level radioactive wastewater. In addition, as low radioactive subsurface water is piling up in sub-drain pits of Units 5 and 6 and a part of subsurface water is running into buildings. We are concerned that important equipment to secure the safety of reactors may be submerged. Based on the Section 1 of the Article 64 of the Nuclear Reactor Regulation Law, we have decided to discharge to the sea approximately ten thousand tons of the accumulated low level radioactive water and a total of fifteen hundred tons of the low level radioactive subsurface water stored in the

sub drain pits of Unit 5 and 6 as soon as we get ready.
-We evaluate the impact on the discharge of the low radioactive wastewater to the sea as approximately 0.6 mSv per year per an adult if an adult eats adjacent fish and seaweeds everyday. The amount (0.6 mSv of effective radioactive doses per year) is one-forth of annual radioactive dose to which the general public is exposed from nature.
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-We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

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Press Releases

Press Release (Apr 06,2011)
The results of nuclide analyses of radioactive materials in the air at the site of Fukushima Daiichi Nuclear Power Station (12th release)

On March 22nd 2011, as part of monitoring activity of the surrounding environment, we conducted nuclide analysis of radioactive materials contained in the air which were collected at the site of Fukushima Daiichi Nuclear Power Station, which was damaged by Tohoku-Chihou-Taiheiyo-Oki Earthquake. As a result, radioactive materials were detected and therefore, we summarized the results and reported them to Nuclear and Industry Safety Agency as well as to the government of Fukushima Prefecture.

Three nuclides (Iodine-131, Cesium-134 and Cesium-137) are released as fixed figures. Other nuclides figures are to be released as soon as identified under instruction of NISA.

(previously announced)

On April 5th 2011, we conducted nuclide analysis of radioactive materials contained in the air which were collected at the site of Fukushima Daiichi Nuclear Power Station on the same day. As a result, radioactive materials were detected as described in the exhibit. Accordingly, we have reported the result of analysis to Nuclear and Industrial Safety Agency and Fukushima Prefecture.

We are planning to conduct these surveys continuously.

attachment1:The result of the nuclide analysis of radioactive materials in the air at the site of Fukushima Daiichi Nuclear Power Station (PDF11.9KB)
attachment2:The result of the nuclide analysis of radioactive materials in the air at the site of Fukushima Daini Nuclear Power Station (PDF 11.8KB)
attachment3:Nuclide analysis of radioactive materials in the air Fukushima Daiichi Nuclear Power Station(PDF 12.4KB)
attachment4:Nuclide analysis of radioactive materials in the air Fukushima Daini Nuclear Power Station(PDF 12.7KB)

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Please provide comments to RST by 0200 April 6

Considerations on Reactor Pressure Vessel (RPV) Injection Rate

Known Information (NISA press release 0700 4/5)

Unit 1 - Freshwater injection through Feedwater system	Rate $6m^3$/hr (26.4 gpm)
Unit 2 - Freshwater injection through Fire Water and LPCI	Rate $8m^3$/hr (35.2 gpm)
Unit 3 - Freshwater injection through Fire Water and LPCI	Rate $7m^3$/hr (30.8 gpm)

Assumptions

We believe Japan is lowering RPV injection to minimize steam condensation, and to minimize eventual leakage into the environment. Is this assumption correct?

Considerations

1. US industry considers that maximizing injection flow would enhance steam inerting by increasing the steam generation rate, and that the increase steam generation rate would create more steam than is condensed by the increased flow. Have you considered increasing RPV injection rate and trending available parameters to ensure that sufficient steam is generated to maintain a steam blanketed atmosphere in the drywell?

2. It is difficult to determine when core cooling is adequate considering core configuration, salt buildup issues, indirect instrumentation and instrumentation time lag. What criteria are you using to determine adequacy of core cooling ?

3. The addition of nitrogen purge allows RPV injection flow to be maximized without concern of hydrogen combustion. Is it your plan to increase RPV injection at that time?

4. Use of core spray would enhance decay heat removal:

    a. Have you considered re-starting injecting via Core Spray on Unit 1 to cool the core inside shroud? (Any Freshwater flow may also dissolve the salt clogging.)

    b. Have you considered injecting via Core Spray on Unit 2 & 3 to cool Core inside shroud?

5. Core geometry changes may lead to localized criticalities, which would be associated with unexplained Temperature and Radiation Levels. Have you considered maintaining Boron injection capability as a contingency?

6. What assistance would be helpful to develop a long-term cooling system for the RPV and core (e.g. an external pump and heat exchanger setup)?

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Considerations on Primary Containment Fill Possibilities

Known Information

Unit 1 Possibly Damaged (holding some pressure)	0.150 MPa (7.0 psig)	D/W
	0.150 MPa (7.0 psig)	Torus
Unit 2 Assumed Damaged (at Atmospheric Pressure)	0.100 MPa (0.2 psig)	D/W
	Unknown	Torus
Unit 3 Assumed Damaged (at Atmospheric Pressure)	0.108 MPa (0.9 psig)	D/W
	0.173 MPa (10.4 psig)	Torus

Assumptions

TEPCO prefers to not fill containments. Is it because containments may be damaged and not able to hold water? OR Is it because of increase seismic risk due to the added weight of water? OR Are there other reasons?

Considerations

1. The severe accident management guides (SAMGs) state:

    a. It is important to ensure that a minimum of 4 feet of water on the drywell floor is provided such that any exvessel core material will adequately quench.
    b. It is important to flood Primary Containment up to bottom of the RPV lower head to cool the RPV bottom head and reduce the chance of core debris breaching the Bottom of the RPV. This is important if all of the cores remain within the vessel. This may also be important if there is increased corrosion from the previous saltwater injection on RPV lower head welds and penetrations.
    c. It is important to eventually raise Primary Containment water level to the Top of Active Fuel region to provide direct vessel cooling up to that level.

    How is vessel cooling accomplished to keep the fuel from going exvessel?

    If fuel penetrates the reactor vessel, how will the material be adequately quenched to prevent a spike in dry well pressure?

2. What assistance would be helpful to develop a long-term cooling system for the Primary Containment flooded volume (e.g. an external pump and heat exchanger setup) will eventually be needed?

3. Could corrosion or penetration failure degrade the containment pressure retention capacity? If so to what extent.

4. Could releases to the turbine building come from leakage pathways originating in the containment? If so from where?

From: Mayros, Lauren
Sent: Wednesday, April 06, 2011 1:34 PM
To: LIA02 Hoc
Cc: Abrams, Charlotte; Smiroldo, Elizabeth; Bloom, Steven; Schwartzman, Jennifer; Wittick, Brian; Afshar-Tous, Mugeh; 'ShafferMR@state.gov'; Tobin, Jennifer; Jones, Andrea; Young, Francis; Ramsey, Jack; Henderson, Karen; English, Lance; Shepherd, Jill; Baker, Stephen; Emche, Danielle; Fragoyannis, Nancy; LIA03 Hoc; Stahl, Eric; Owens, Janice; Fehst, Geraldine; Foggie, Kirk; Breskovic, Clarence
Subject: RE: One Page Summary March 6, 2011

Who is doing these one page summaries? Just wondering if the night shift is responsible for writing these up, as I am doing the 3 – 12 shift tonight and don't want to drop the ball on things.

Thanks,
Lauren

From: LIA02 Hoc
Sent: Wednesday, April 06, 2011 7:12 AM
To: Doane, Margaret; Mamish, Nader
Cc: Abrams, Charlotte; Smiroldo, Elizabeth; Bloom, Steven; Schwartzman, Jennifer; Wittick, Brian; Afshar-Tous, Mugeh; 'ShafferMR@state.gov'; Tobin, Jennifer; Mayros, Lauren; Jones, Andrea; Young, Francis; Ramsey, Jack; Henderson, Karen; English, Lance; Shepherd, Jill; Baker, Stephen; Emche, Danielle; Fragoyannis, Nancy; LIA03 Hoc; Stahl, Eric; Owens, Janice; Fehst, Geraldine; Foggie, Kirk; Breskovic, Clarence; LIA02 Hoc
Subject: One Page Summary March 6, 2011

OFFICIAL USE ONLY

Attached is One Page Summary for March 6, 2011.

OFFICIAL USE ONLY

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Wednesday, March 6, 2011
For the morning Chairman brief read-out

Staff are completing hand-off activities until the departure of Team 2. Currently 15 NRC staff are on the ground in Japan and 1 is stationed with the Navy's Pacific command in Hawaii.

OIP staff continue to participate in the daily 11 a.m. NRC/NISA/TEPCO meetings.

In follow up to the April 4 meeting wherein Nei Hisanori, Deputy Director of NISA, mentioned to NRC that NISA and the GOJ have received "acute criticism" that NRC's technical advice has not been followed, OIP staff reported that the message to USG personnel to stop critiquing NISA/GOJ appears to have been effectively communicated and the tone with Japanese counterparts is much improved.

OIP staff have been working with the interagency to consolidate all equipment request lists for better coordination. The list will be managed from the embassy. Intent is to get the Kabinet to review and concur on the request list and coordinate with IAEA to post on ENAC, thereby eliciting support from other countries.

OIP staff has been working with Embassy staff on a fact sheet that will be posted on the Embassy's website. It deals with U.S. nuclear related assistance to Japan. NRC's ET and OPA (Holly Harrington) have seen the draft and provided feedback. It is intended to be posted Thursday JST.

Nakagawa, JNES, is expected to pay an informal visit at the embassy Wednesday. A more formal meeting is expected Friday to engage on future work associated with the U.S. TMI experience and specific technical reviews tasked to NISA.

PNNL representatives approached Danielle Tuesday and stated their analysis indicates the Unit 3 & 4 SFPs were empty for at least two days.

From: LIA07 Hoc
Sent: Wednesday, April 06, 2011 4:21 PM
To: Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: One Pager - April 6, 1500 EDT
Attachments: April 6 1500 EDT one pager.pdf

Attached is the 1500 EDT, April 6, 2011 one pager.
-Sara

From: ET02 Hoc
Sent: Wednesday, April 06, 2011 5:01 PM
To: ET07 Hoc
Subject: FW: Protection of Agency Documents in the Operations Center

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From: ET01 Hoc
Sent: Wednesday, April 06, 2011 5:01:12 PM
To: ET02 Hoc
Subject: FW: Protection of Agency Documents in the Operations Center
Auto forwarded by a Rule

From: OST02 HOC
Sent: Wednesday, April 06, 2011 5:01:02 PM
To: LIA06 Hoc; LIA08 Hoc; LIA04 Hoc; OST03 HOC; OST05 Hoc; LIA09 Hoc; LIA05 Hoc; LIA01 Hoc; LIA11 Hoc; LIA12 Hoc; LIA03 Hoc; LIA10 Hoc; LIA02 Hoc; ET01 Hoc; ET02 Hoc; ET03 Hoc; ET04 Hoc; ET05 Hoc; ET06 Hoc; ET07 Hoc; OST01 HOC; OST02 HOC; OST04 Hoc; LIA07 Hoc; RST01 Hoc; RST01A Hoc; RST01B Hoc; RST02 Hoc; RST03 Hoc; RST04 Hoc; RST05 Hoc; RST06 Hoc; RST07 Hoc; RST08 Hoc; RST09 Hoc; RST10 Hoc; RST11 Hoc; RST12 Hoc; RST13 Hoc; RST14 Hoc; RST15 Hoc; Hoc, RST16; PMT01 Hoc; PMT02 Hoc; PMT03 Hoc; PMT04 Hoc; PMT05 Hoc; PMT07 Hoc; PMT08 Hoc; PMT09 Hoc; PMT10 Hoc; PMT11 Hoc; Hoc, PMT12; PMTERDS Hoc; GIS Hoc
Subject: Protection of Agency Documents in the Operations Center
Auto forwarded by a Rule

Protection of Agency Documents in the Operations Center

The NRC appreciates the hard work of everyone involved in the Japan response. Your efforts have been extensive and exhaustive and have produced a number of documents that have been used by many people throughout the government. This message is a reminder to carefully respect the markings on all documents and reiterate to everyone receiving them the importance of respecting the nature of the distribution of these documents. For us to be able to make effective decisions only public documents should be released outside of the appropriate distribution channels. Keep up your great work but be mindful of your responsibility as well.

Thank You,
Operations Center

000251

From: Morris, Scott
Sent: Wednesday, April 06, 2011 5:54 AM
To: RST06 Hoc
Subject: RE: April 6 0600 EDT Brief one pager.docx

thanks

From: RST06 Hoc
Sent: Wednesday, April 06, 2011 5:46 AM
To: Morris, Scott
Subject: FW: April 6 0600 EDT Brief one pager.docx

Here you go!

From: Morris, Scott
Sent: Wednesday, April 06, 2011 5:15 AM
To: RST06 Hoc
Subject: April 6 0600 EDT Brief one pager.docx

Please update

000252

From: RST08 Hoc
Sent: Wednesday, April 06, 2011 3:33 PM
To: RST01 Hoc
Subject: Final SFP Assessment Document
Attachments: 04-06-11 1200 RST Assessment Spent Fuel Pool.docx

Follow Up Flag: Follow up
Flag Status: Flagged

For Final Review,

At this point we are only looking for technical errors, please have comments back to us by 1000 On 4/7/11.

Thanks,

Mike

Mike Brown
Reactor Safety Team

000/253

From: LIA06 Hoc
Sent: Wednesday, April 06, 2011 11:49 AM
To: LIA08 Hoc
Subject: FW: Request for Translation - FW: URGENT:Start of Injection of Nitrogen Gas
Attachments: TEPCO.pdf

Forgot you and sent to myself!

Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

-----Original Message-----
From: LIA06 Hoc
Sent: Wednesday, April 06, 2011 11:48 AM
To: Bahadur, Sher; Ruland, William; Nakanishi, Tony
Cc: LIA06 Hoc
Subject: Request for Translation - FW: URGENT:Start of Injection of Nitrogen Gas

If possible, could Mr. Nakanishi please translate the attached document. We do need this as soon as possible, so an estimate of time required would be greatly appreciated.

Thanks

Tom Bergman
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

-----Original Message-----
From: LIA02 Hoc
Sent: Wednesday, April 06, 2011 11:43 AM
To: LIA06 Hoc
Subject: FW: URGENT:Start of Injection of Nitrogen Gas

-----Original Message-----
From: RST01 Hoc
Sent: Wednesday, April 06, 2011 11:05 AM
To: LIA02 Hoc
Cc: Hoc, PMT12
Subject: FW: URGENT:Start of Injection of Nitrogen Gas

Could you get this document translated into English.
RST Coordinator

000254

-----Original Message-----
From: LIA02 Hoc
Sent: Wednesday, April 06, 2011 10:38 AM
To: Hoc, PMT12; RST01 Hoc
Subject: FW: URGENT:Start of Injection of Nitrogen Gas

-----Original Message-----
From: Emche, Danielle
Sent: Wednesday, April 06, 2011 10:29 AM
To: LIA02 Hoc
Subject: Fw: URGENT:Start of Injection of Nitrogen Gas

I don't know if you have a translator still there. Either way, this is a notification.
Danielle
Sent from an NRC BlackBerry.

----- Original Message -----
From: PROTOCOLOFFICE-EM <protocoloffice-em@mofa.go.jp>
To: PROTOCOLOFFICE-EM <protocoloffice-em@mofa.go.jp>
Sent: Wed Apr 06 09:45:08 2011
Subject: URGENT:Start of Injection of Nitrogen Gas

URGENT

(22:10) Wednesday, 6 April 2011

To All Missions (Embassies, Consular posts and International Organizations in Japan)

TEPCO announced that the start of injection of nitrogen gas into the containment vessel of the Unit 1 of the Fukushima Dai-ichi Nuclear Power Plant at around 22:30 with a view to avoiding possibility of a hydrogen explosion.

The press release by TEPCO (only in Japanese at this stage) is attached to this message.

Details will follow at the tomorrow's regular briefing.

Contact: International Nuclear Energy Cooperation Division, Tel 03-5501-8227

福島第一原子力発電所１号機原子炉格納容器への窒素封入の実施について

平成 23 年４月６日
東京電力株式会社

当社福島第一原子力発電所１号機につきましては、原子炉格納容器内に水素ガスが蓄積している可能性があることから、原子炉格納容器内に窒素ガスを封入することを検討しておりました。

本件について、本日、経済産業大臣より、同発電所１号機の窒素封入に関して、窒素封入の必要性、実施方法、安全性に係る影響評価等についての報告徴収の指示を受けたことから、同日、この指示に基づきその内容をとりまとめ、経済産業大臣にご報告いたしました。報告内容につきましては、経済産業省において審議いただき、当社の報告内容について了解をいただきました。

今後、当社が報告した実施方法に基づき、本日午後 10 時 30 分頃より１号機原子炉格納容器への窒素封入を実施いたします。

以 上

<別紙１>

窒素封入の必要性

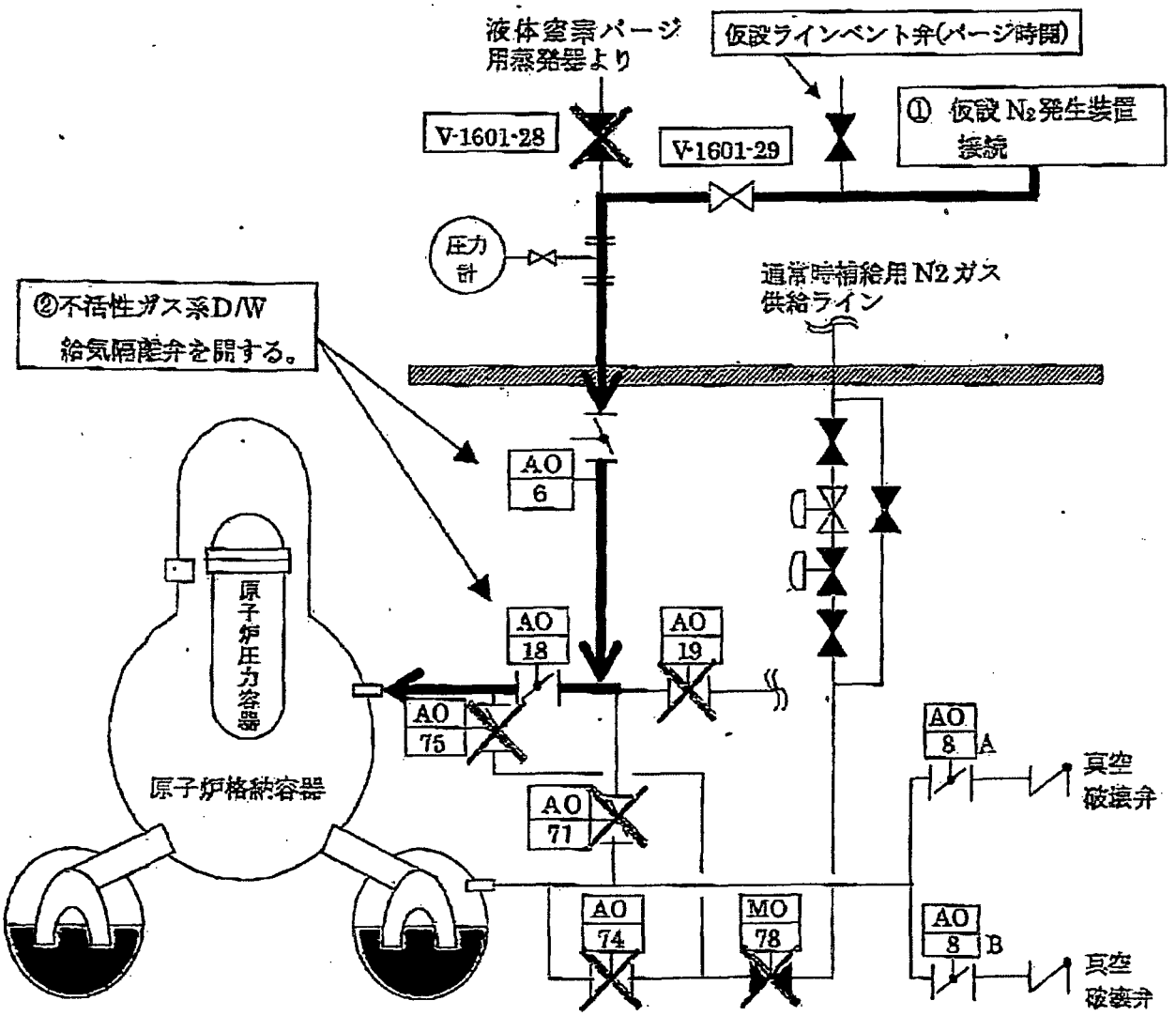
- 福島第一原子力発電所１～３号機含て、現在は炉心部の崩壊熱除去に伴う蒸気が供給されている状況であり、原子炉格納容器（PCV）内が蒸気雰囲気となっていると考えられるため、原子炉圧力容器（RPV）内で発生した水素の爆発のリスクは極めて小さい。

- しかし、１～３号機全てRPVバウンダリ損傷の可能性があると考えられる。この状態において炉心注水冷却を続けると、やがてRPVからPCVにリークした水素のPCV中濃度が高まることによって可燃限界に達する懸念があるため、１～３号機ともPCVに窒素（N_2）を封入して水素燃焼のポテンシャルを下げる必要がある。

（PCV内の蒸気は、PCV壁での凝縮（原子炉建屋側への伝熱）と、原子炉への注水のうち崩壊熱除去に寄与しなかった水による凝縮で減少する。なお、PCV壁での凝縮熱伝達は崩壊熱除去に寄与しなかった水による凝縮と比較し、大きくはない。一方で原子炉への注水は継続することが必須であり、崩壊熱除去に必要な流量以上での注水は継続される。）

- １号機はD/Wの損傷が２，３号機と比較して軽度であると考えられ、従って今後炉心注水冷却によって水素と共にPCV内の水蒸気が凝縮した場合、PCVが負圧となり、インリークによってPCV内に酸素が供給され、かつ水素分圧が高まって可燃限界に達しやすいと考えられるため、まず１号機のN_2封入を実施、その後２，３号機のN_2封入も実施する。

以　上



原子炉格納容器への窒素ガス封入　系統概略図

From: LIA06 Hoc
Sent: Wednesday, April 06, 2011 2:47 PM
To: McGinty, Tim
Subject: RE: April 6 1500 EDT Brief one pager.docx

No comments.

Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From: McGinty, Tim
Sent: Wednesday, April 06, 2011 2:18 PM
To: LIA06 Hoc; RST01 Hoc; Hoc, PMT12
Cc: LIA07 Hoc; Wiggins, Jim; Zimmerman, Roy; Giitter, Joseph
Subject: April 6 1500 EDT Brief one pager.docx

Please review proposed draft one-pager for 1500 update. Comment by 1445 EDT please. I deleted a decent amount to get it back down to one page, please try to keep any proposed editions as brief as possible. Thanks, Tim

000255

From: RST01 Hoc
Sent: Thursday, April 07, 2011 4:03 PM
To: Hoc, RST16
Subject: FW: Night Shift at USAID

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Thursday, March 31, 2011 11:00 PM
To: LIA01 Hoc; LIA02 Hoc; LIA11 Hoc; LIA08 Hoc; LIA07 Hoc; LIA12 Hoc; LIA04 Hoc; LIA03 Hoc; LIA06 Hoc; RST01 Hoc; PMT01 Hoc; Hoc, PMT12; PMT09 Hoc; ET07 Hoc
Cc: Kozal, Jason; Dudek, Michael; Anderson, Joseph; Marshall, Jane; Gott, William; Grant, Jeffery
Subject: Night Shift at USAID

All,

Tonight will be the last night that night shift is staffed at USAID. Starting tomorrow (Friday), normal staffing hours for the NRC rep here at USAID will be 7am to 7pm. After hours communications and requests should be emailed to the NRC email account here (rmtpactsu_elnrc@ofda.gov). After hours emergencies should be directed to the LT Federal Liaison who will direct the request to someone on call. If you have any questions, please contact Jason Kozal at Jason.kozal@nrc.gov. Thank you,

Jeff Kowalczik
NRC Liaison to USAID

QQQ/256

From: Salay, Michael
Sent: Thursday, April 07, 2011 8:37 PM
To: RST01 Hoc
Subject: RE: 04-07-11 2000 RST Assessment Spent Fuel Pool.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Thank you,
-Mike

From: RST01 Hoc
Sent: Thursday, April 07, 2011 8:27 PM
To: Salay, Michael
Subject: FW: 04-07-11 2000 RST Assessment Spent Fuel Pool.docx

FYI- This is still work in progress, but we got the go ahead to get you something.

Greg
RST Coordinator

From: RST07 Hoc
Sent: Thursday, April 07, 2011 8:25 PM
To: RST01 Hoc
Subject: 04-07-11 2000 RST Assessment Spent Fuel Pool.docx

Site team,

This is the in progress Fuel pool assessment. This has not been reviewed by the consortium.

Chuck Norton
BWR RST Analyst

000257

Attachment 04-07-11 2000 RST Assessment Spent Fuel Pool.docx
(140655 bytes) cannot be converted to PDF format.

From: RST07 Hoc
Sent: Thursday, April 07, 2011 8:25 PM
To: RST01 Hoc
Subject: 04-07-11 2000 RST Assessment Spent Fuel Pool.docx
Attachments: 04-07-11 2000 RST Assessment Spent Fuel Pool.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Site team,

This is the in progress Fuel pool assessment. This has not been reviewed by the consortium.

Chuck Norton
BWR RST Analyst

qqq | 258

From: Jackson, Todd
Sent: Thursday, April 07, 2011 10:08 AM
To: PMT10 Hoc
Subject: Out of Office: Fukushima Daiichi Radiation Monitor Readings 03302011.xlsx

I will be out of the office until approximately Monday,April 11, 2011 and may not be able to regularly access email during this time. If you need immediate assistance, please contact the DNMS Division Secretary at 610-337-5274.

Todd Jackson

aaa/254

From: ET02 Hoc
Sent: Thursday, April 07, 2011 10:29 AM
To: ET07 Hoc
Subject: FW: FYI - Report of NISA view on NYT ariticle - FW: One Page Summary March 7, 2011

From: ET01 Hoc
Sent: Thursday, April 07, 2011 10:28:38 AM
To: ET02 Hoc
Subject: FW: FYI - Report of NISA view on NYT ariticle - FW: One Page Summary March 7, 2011
Auto forwarded by a Rule

From: LIA06 Hoc
Sent: Thursday, April 07, 2011 10:28:29 AM
To: Virgilio, Martin; ET01 Hoc; RST Communicator
Subject: FYI - Report of NISA view on NYT ariticle - FW: One Page Summary March 7, 2011
Auto forwarded by a Rule

FYI- this email came in while we were meeting on subject document.

Tom Bergman
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From: LIA02 Hoc
Sent: Thursday, April 07, 2011 10:22 AM
To: LIA06 Hoc; LIA08 Hoc
Subject: FW: One Page Summary March 7, 2011

From: Emche, Danielle
Sent: Thursday, April 07, 2011 9:21 AM
To: LIA02 Hoc; Doane, Margaret; Mamish, Nader; Foggie, Kirk; Abrams, Charlotte
Subject: Re: One Page Summary March 7, 2011

A quick message about the NISA-TEPCO meeting today (Eric reported out to HQ before I got back), it went very well. NISA delivered the message that, "we don't care about the article because we know we're working together in the same effort." They also offered that they will not share our OUO documents with the press. Lyons delivered a positive message too, thanking Japan for, "helping th U.S. to help in understanding the situation in Japan."

Danielle
Sent from an NRC BlackBerry.

000|2600

From: LIA02 Hoc
To: Doane, Margaret; Mamish, Nader
Cc: Abrams, Charlotte; Smiroldo, Elizabeth; Bloom, Steven; Schwartzman, Jennifer; Wittick, Brian; Afshar-Tous, Mugeh; 'ShafferMR@state.gov' <'ShafferMR@state.gov'>; Tobin, Jennifer; Mayros, Lauren; Young, Francis; Ramsey, Jack; Henderson, Karen; English, Lance; Shepherd, Jill; Baker, Stephen; Emche, Danielle; Fragoyannis, Nancy; LIA03 Hoc; Stahl, Eric; Owens, Janice; Fehst, Geraldine; Foggie, Kirk; Breskovic, Clarence; LIA02 Hoc
Sent: Thu Apr 07 07:43:55 2011
Subject: One Page Summary March 7, 2011

~~OFFICIAL USE ONLY~~

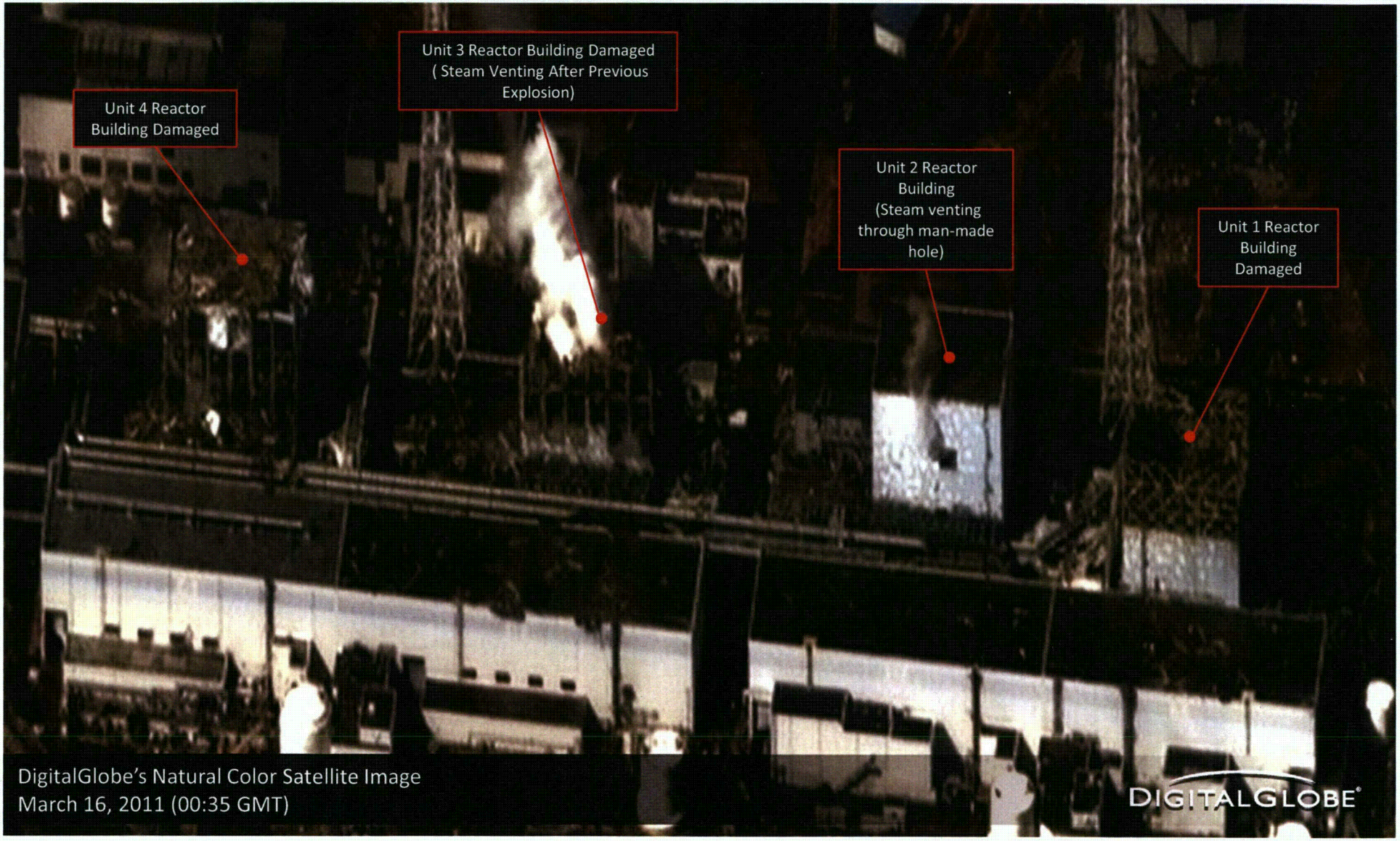
Attached is One Page Summary for March 7 2011.

~~OFFICIAL USE ONLY~~

Fukushima Daiichi Nuclear Power Plant

Okuma, Japan

37 25 18N 141 01 56E



DigitalGlobe's Natural Color Satellite Image
March 16, 2011 (00:35 GMT)

From: Gott, William
Sent: Thursday, April 07, 2011 12:00 PM
To: ET07 Hoc
Subject: Re: schedule

Ok

From: ET07 Hoc
To: Gott, William
Sent: Thu Apr 07 11:59:07 2011
Subject: RE: schedule

Great. Keep in mind we need to approve T&L by 3 today in case the government shuts down (so we can get our paychecks for this PP). If you can give me a few minutes before 3 to do that, I'd appreciate it. Thanks.

Back to fun with the 7.1 aftershock.

From: Gott, William
Sent: Thursday, April 07, 2011 11:19 AM
To: ET07 Hoc; Grant, Jeffery
Subject: Re: schedule

I am pretty flexible and expected to be in on Saturday and Sunday. Having a day off mid week works for me. I will discuss when I come in today.

Bill

From: ET07 Hoc
To: Gott, William; Grant, Jeffery
Sent: Thu Apr 07 07:29:29 2011
Subject: schedule

Looks like we're rolling through another week... need to fill the watchbill through the end of next week (likely next weekend as well). So, pick your shifts and what day(s) you would like to try to take off.

QQQ | 261

From: Miller, Marie
Sent: Thursday, April 07, 2011 10:08 AM
To: PMT10 Hoc
Subject: Out of Office: Fukushima Daiichi Radiation Monitor Readings 03302011.xlsx

I am out of the office until April 11. Please contact the Division Secretary at 610-337-5274, if you have any questions or contact Blake Welling, Chief Materials Security and Industrial Branch at 610-337-5205.

RAI 262

From: Whitcomb, Robert C. (CDC/ONDIEH/NCEH) <byw3@cdc.gov>
Sent: Thursday, April 07, 2011 11:09 AM
To: PMT10 Hoc; Miller, Charles W. (CDC/ONDIEH/NCEH)
Cc: Charp, Paul (ATSDR/DHAC/SRAB); Evans, Lynn (CDC/ONDIEH/NCEH)
Subject: RE: Bioconcentration of iodine in marine and terrestrial environments

OK...please send same for Cs-137

Robert C. Whitcomb, Jr., Ph.D., CHP
Radiation Studies Branch, EHHE, NCEH, CDC
4770 Buford Highway, NE (MS-F58)
Atlanta, GA 30341-3717
Telephone: 770.488.3652 Fax: 770.488.1539

From: PMT10 Hoc [mailto:PMT10.Hoc@nrc.gov]
Sent: Thursday, April 07, 2011 10:37 AM
To: Whitcomb, Robert C. (CDC/ONDIEH/NCEH); Miller, Charles W. (CDC/ONDIEH/NCEH)
Cc: Charp, Paul (ATSDR/DHAC/SRAB); Evans, Lynn (CDC/ONDIEH/NCEH)
Subject: Bioconcentration of iodine in marine and terrestrial environments

Charles and Bob,

The following information on iodine bioconcentration comes from the Toxicological Profile for Iodine:

Iodine has been shown to bioaccumulate in many seawater and freshwater aquatic plants (Poston 1986). Freshwater plants (e.g., algae) contain 10^{-5}% by weight of iodine, whereas marine plants (algae) contain 10^{-3}% by weight (NCRP 1983). In freshwater fish, iodine concentrations in tissues range from 0.003 to 0.81 ppm, which gives concentration ratios (fish/water) of 0.9–810. In marine fish, the iodine concentrations range between 0.023 and 0.11 ppm, yielding concentration ratios of between 10 and 20 (Poston 1986). In terrestrial plants, iodine can be taken up through the roots, mainly as iodide and to a lesser extent, as iodate or iodine (Burte et al. 1991; Whitehead 1984). The average iodine concentration in terrestrial plants is 0.42 µg/g. The uptake is dependent on soil conditions and the use of fertilizers (Moiseyev et al. 1984). Distribution of iodine and iodide varies throughout the plant (Voigt et al. 1988). The uptake of iodine into terrestrial plants in combination with deposition of iodine onto the surfaces of plants plays an important role in the transfer of iodine through the soil-plant-cow-milk pathway. The efficiency through which iodine is transferred through this pathway is important in ascertaining the risk of radioiodine exposures in the general human population from continuous or accidental releases of ^{131}I and ^{129}I, especially in children (AEC 1974; Soldat 1976; Tubiana 1982; Voigt et al. 1989).

Poston TM. 1986. Literature review of the concentration ratios of selected radioisotopes in freshwater and marine fish. Battelle Pacific Northwest Labs Report No. DE86-015820 (NTIS/DE86015820), 1-21, 82-84, 243-272.

NCRP. 1983. Iodine-129: Evaluation of releases from nuclear power generation. Bethesda, MD: National Council on Radiation Protection and Management. NCRP Report No. 75.

Burte PP, Nair AGC, Manohar SB, et al. 1991. Iodide and iodine uptake in plants. J Radioanal Nucl Chem 155(6):391-402.

Whitehead DC. 1984. The distribution and transformations of iodine in the environment. Environ Int 10:321-339.

aaa/263

Moiseyev IT, Tikhomirov FA, Perevezentsev VM, Rerikh LA. 1984. Role of soil properties, interspecific plant differences, and other factors affecting the accumulation of radioactive iodine in crops. Soviet Soil Science 16:60-66.

Voigt G, Henrichs K, Prohl G, et al. 1988. Measurements of transfer coefficients fro ^{137}Cs, ^{60}Co, ^{54}Mn, ^{22}Na, ^{131}I and ^{95m}Tc from feed into milk and beef. Radiat Environ Biophys 27:143-152.

Voigt G, Muller H, Prohl G, et al. 1989. Experimental determination of transfer coefficients of ^{137}Cs and ^{131}I from fodder into milk of cows and sheep after the Chernobyl accident. Health Phys 57(6):967-973.

Sam

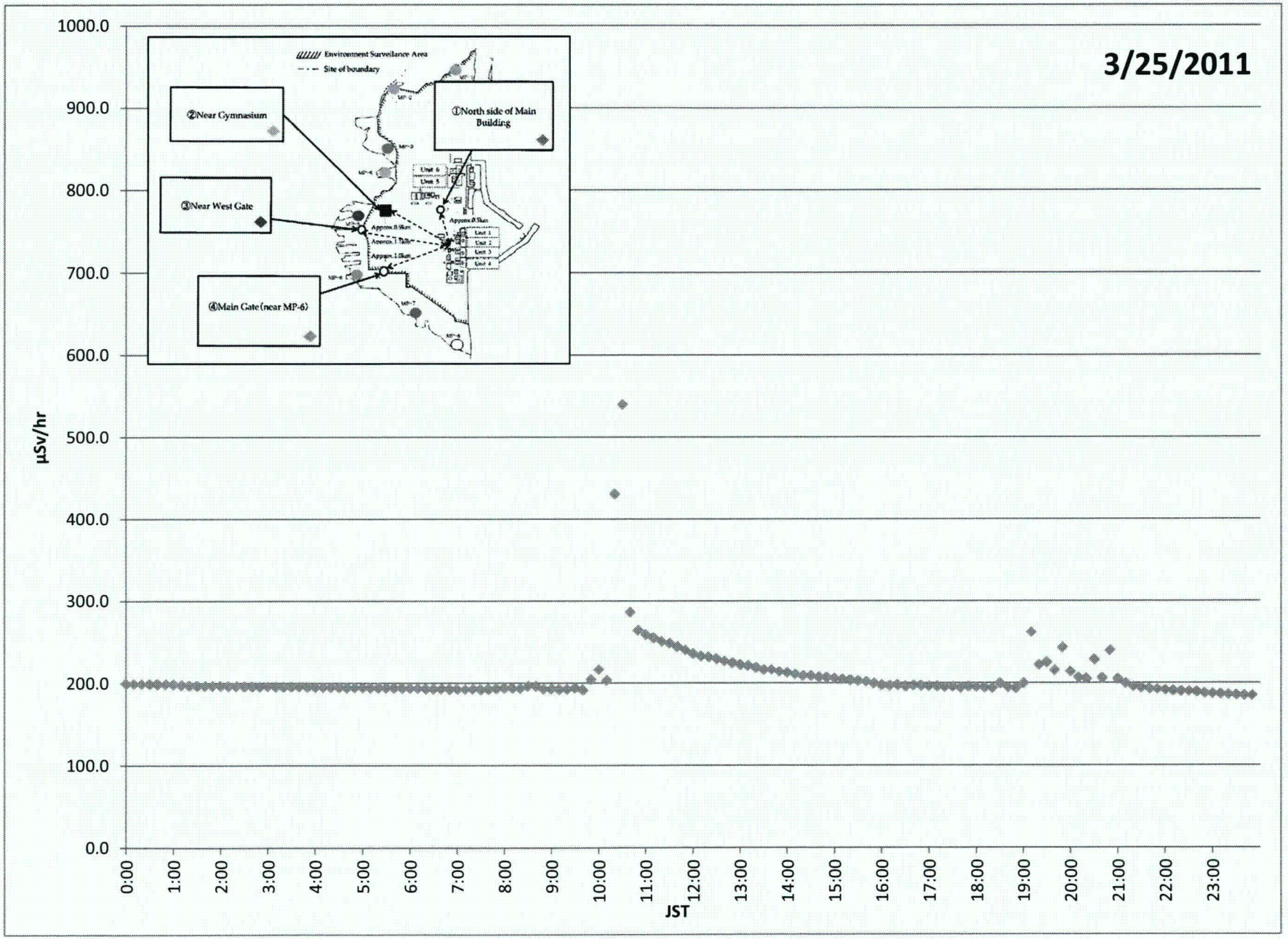
From: PMT10 Hoc
Sent: Thursday, April 07, 2011 10:07 AM
To: LIA_HOC@NRC.GOV
Cc: skeith@cdc.gov
Subject: CDC Liaison Request

Dear Liaison Director,
The CDC Liaison requests the following be made available for sending to the CDC EOC:
-PMT e-mail from 4/7/2011 on RASCAL run for J Team supporting evacuation zone
-NRC assessment addressed in NY Times article dated 4/6/2011 and the updated assessment. RADM Deitchman (CDC IM) is particularly interested in these documents.

Thanks,
Sam Keith
NRC Liaison
skeith@cdc.gov
404-277-0016

0001 264

From: PMT10 Hoc
Sent: Thursday, April 07, 2011 10:07 AM
To: Miller, Marie; Jackson, Todd; Hay, Michael
Subject: Fukushima Daiichi Radiation Monitor Readings 03302011.xlsx
Attachments: Fukushima Daiichi Radiation Monitor Readings 03302011.xlsx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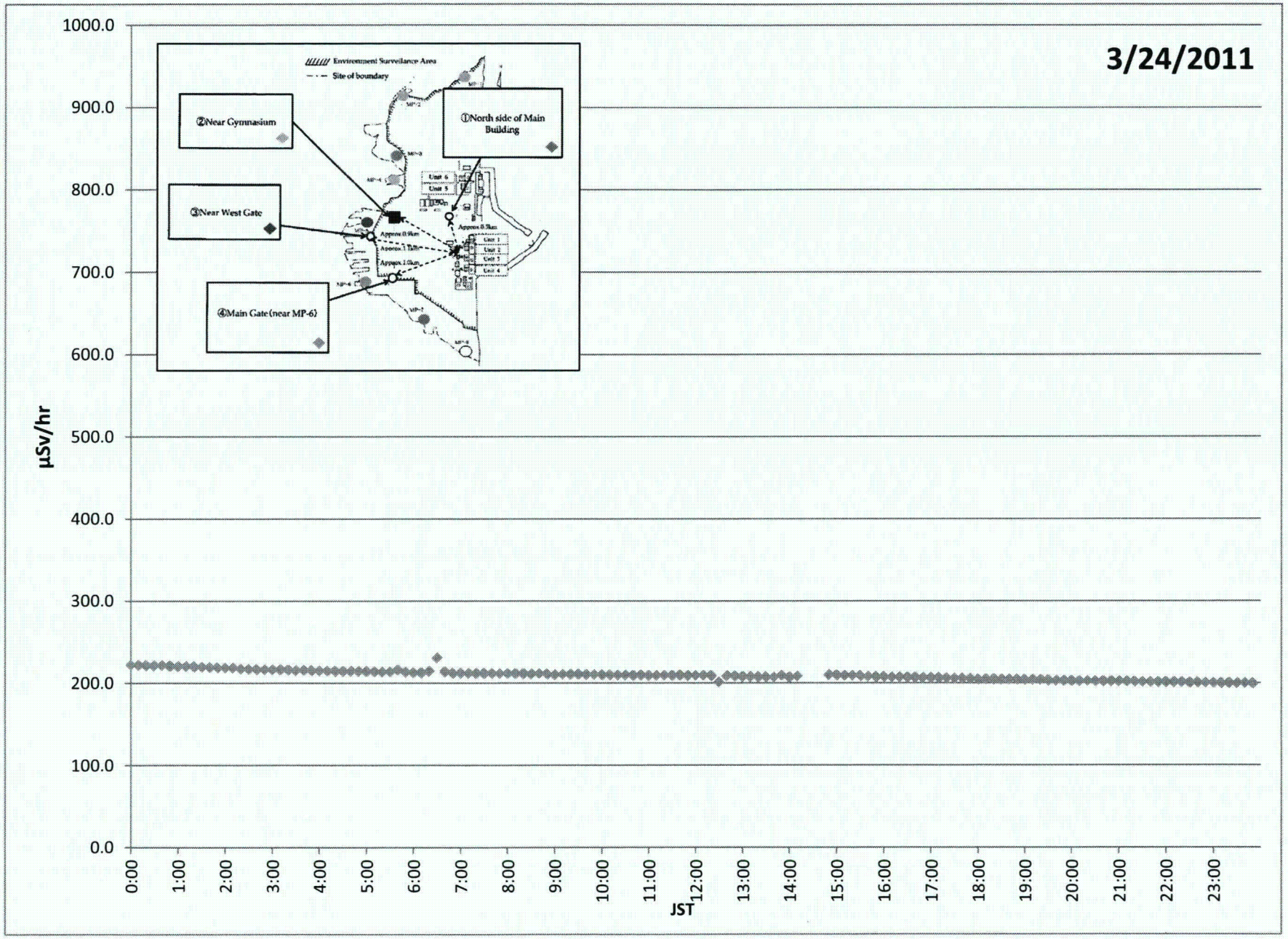
JST
Environment Surveillance Area
Site of boundary
①North side of Main Building
②Near Gymnasium
③Near West Gate
④Main Gate (near MP-6)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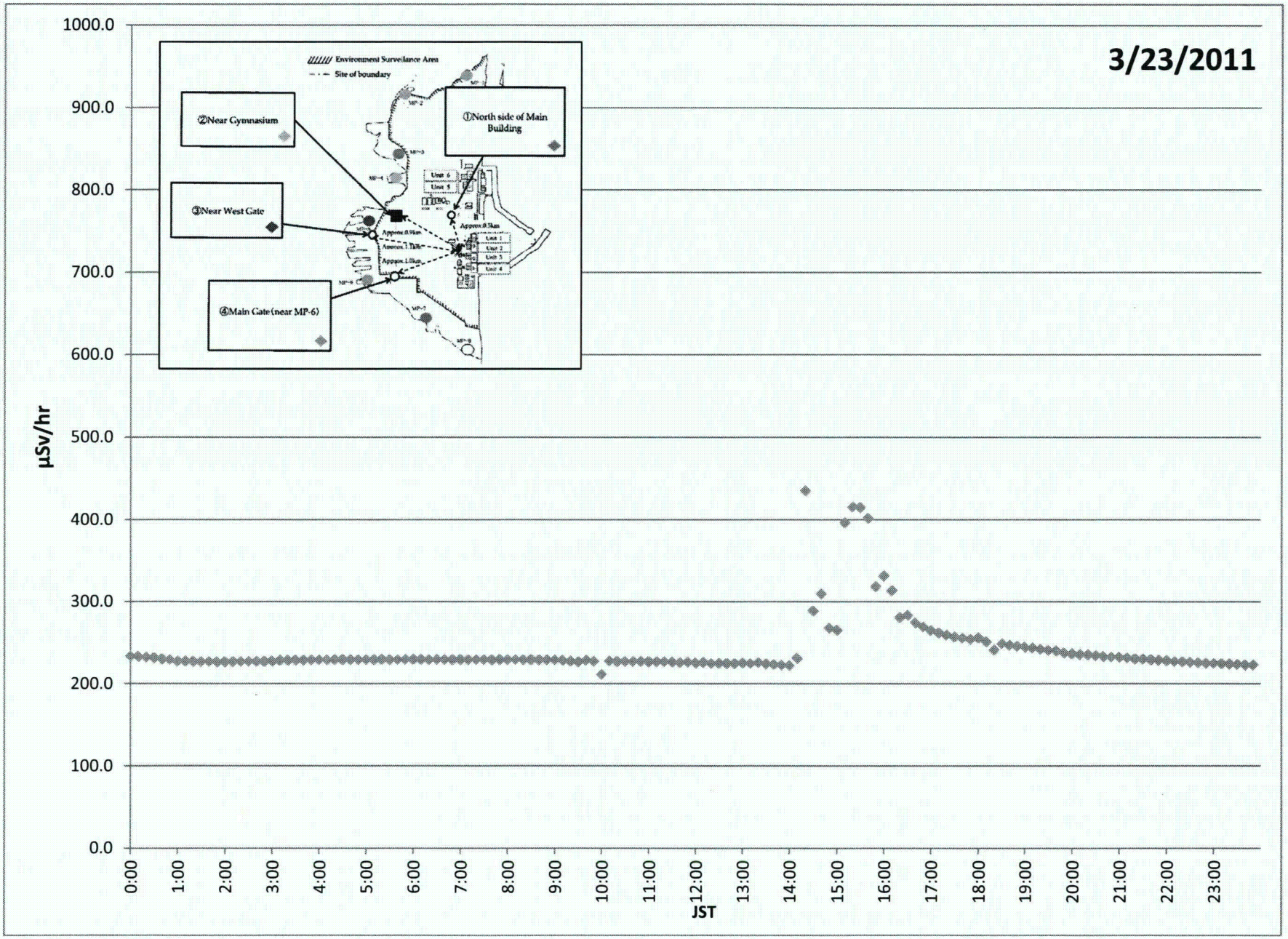
JST
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate (near MP-6)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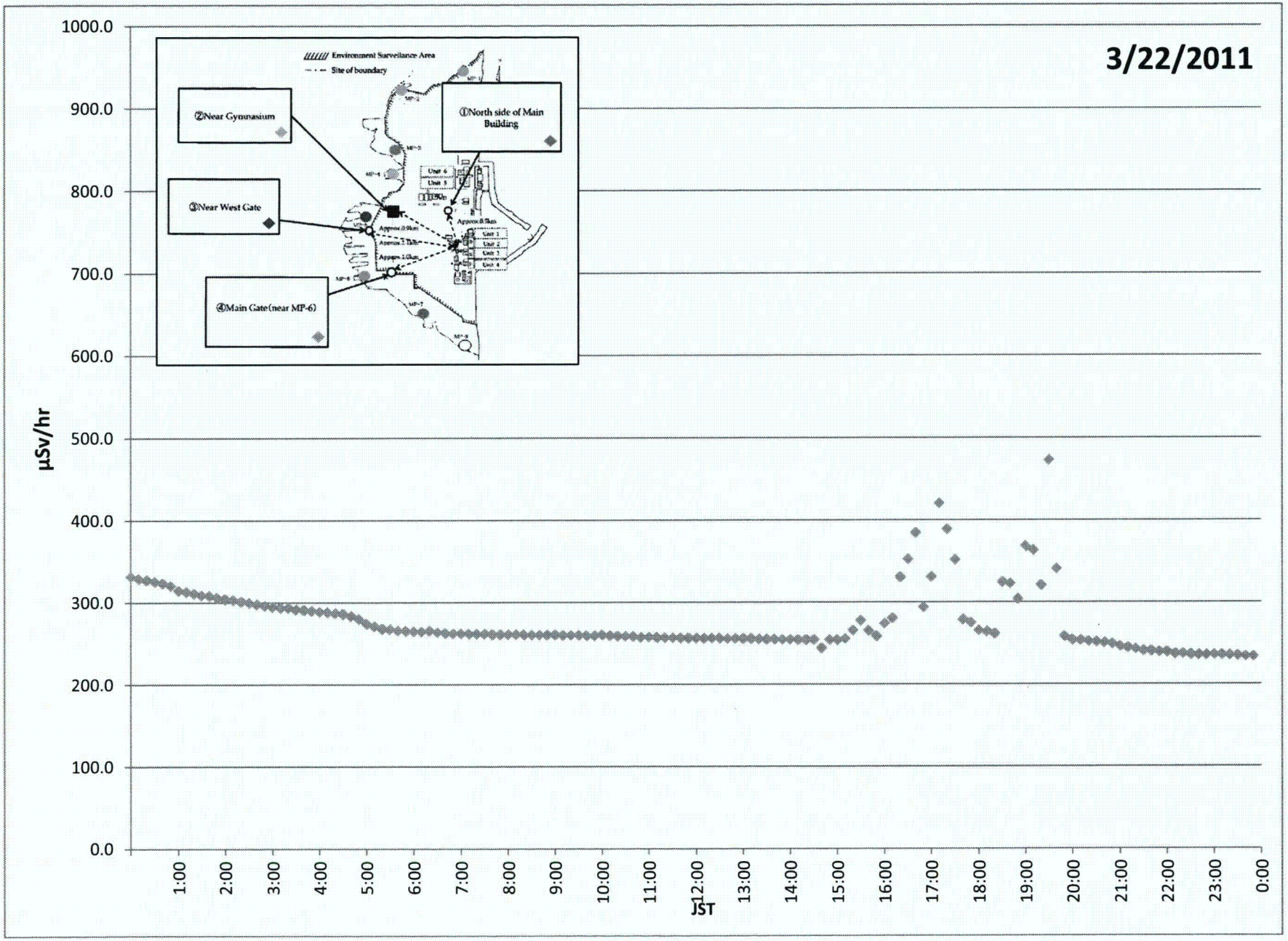
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate (near MP-6)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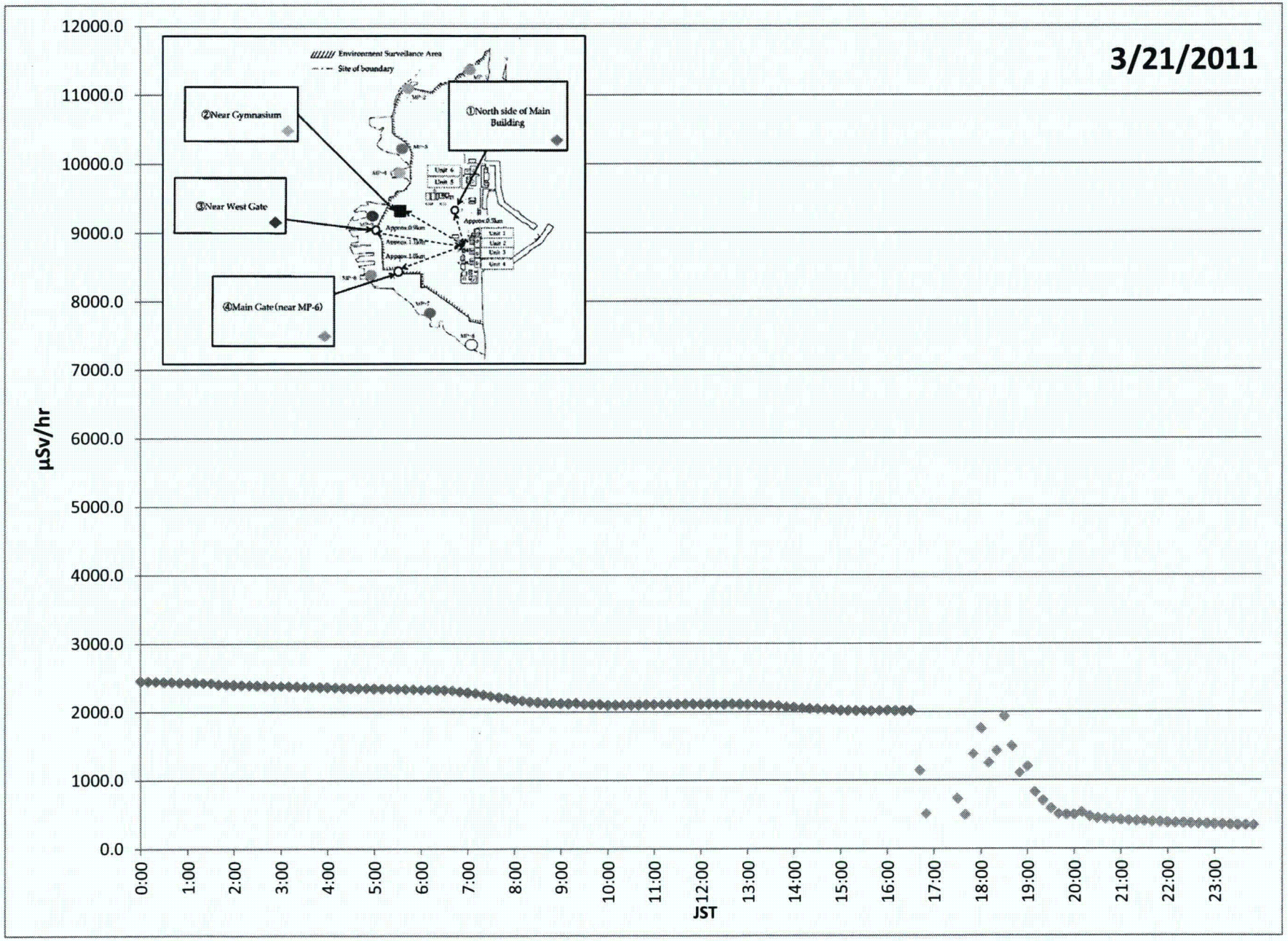
JST
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate(near MP-6)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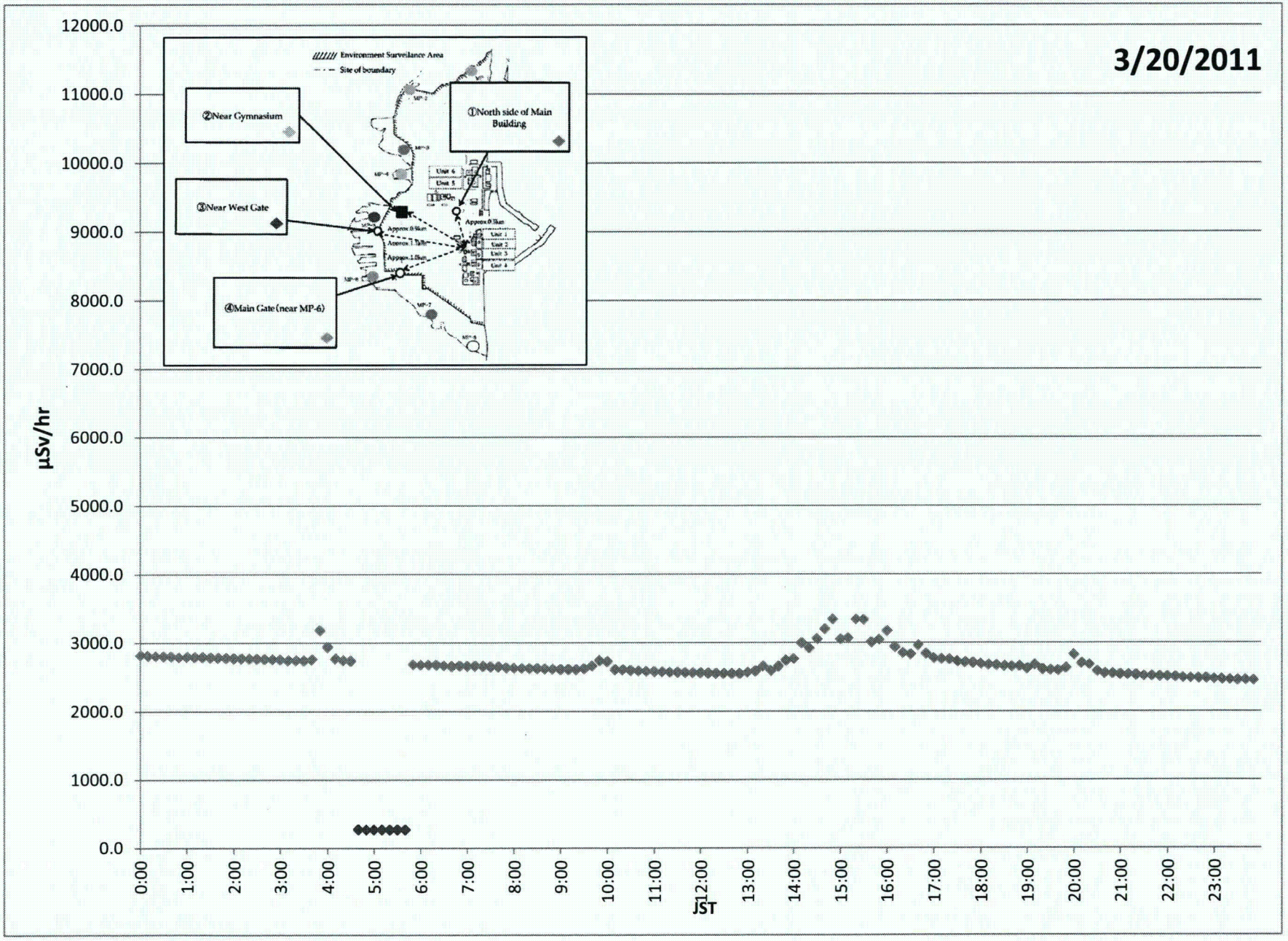
Environment Surveillance Area
Site of boundary
①North side of Main Building
②Near Gymnasium
③Near West Gate
④Main Gate (near MP-6)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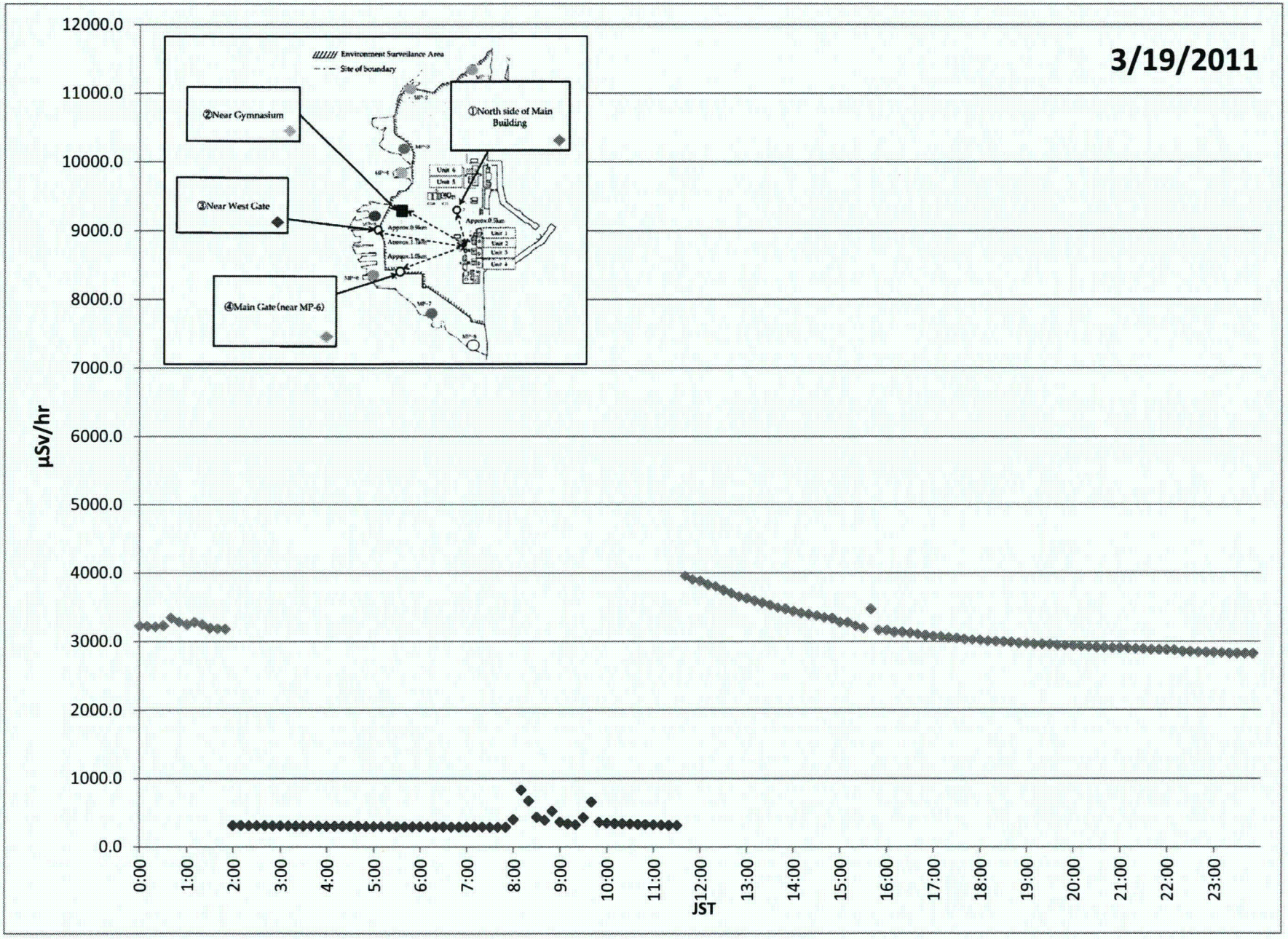
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate (near MP-6)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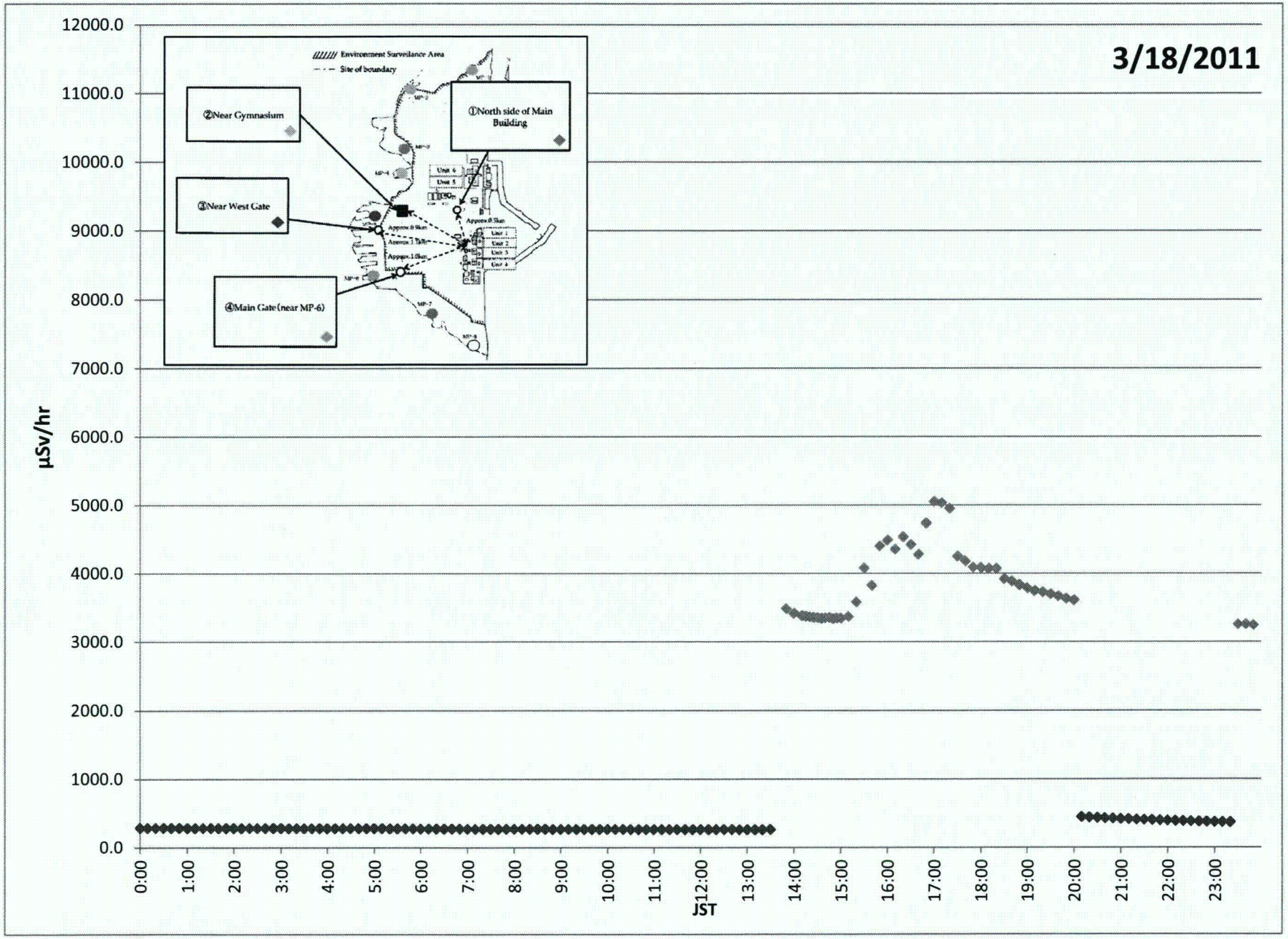
Environment Surveilance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate (near MP-6)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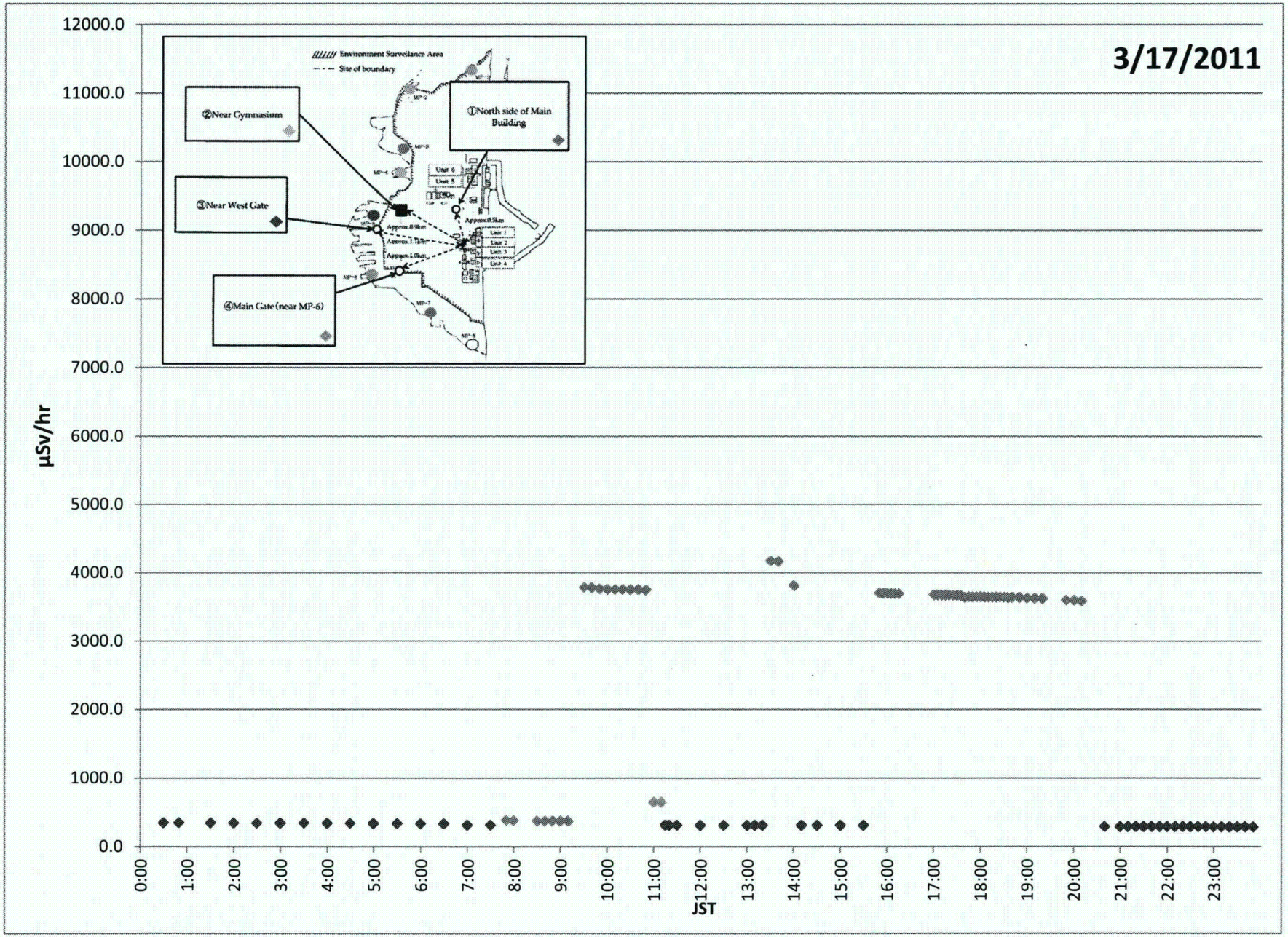
Environment Surveilance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate (near MP-6)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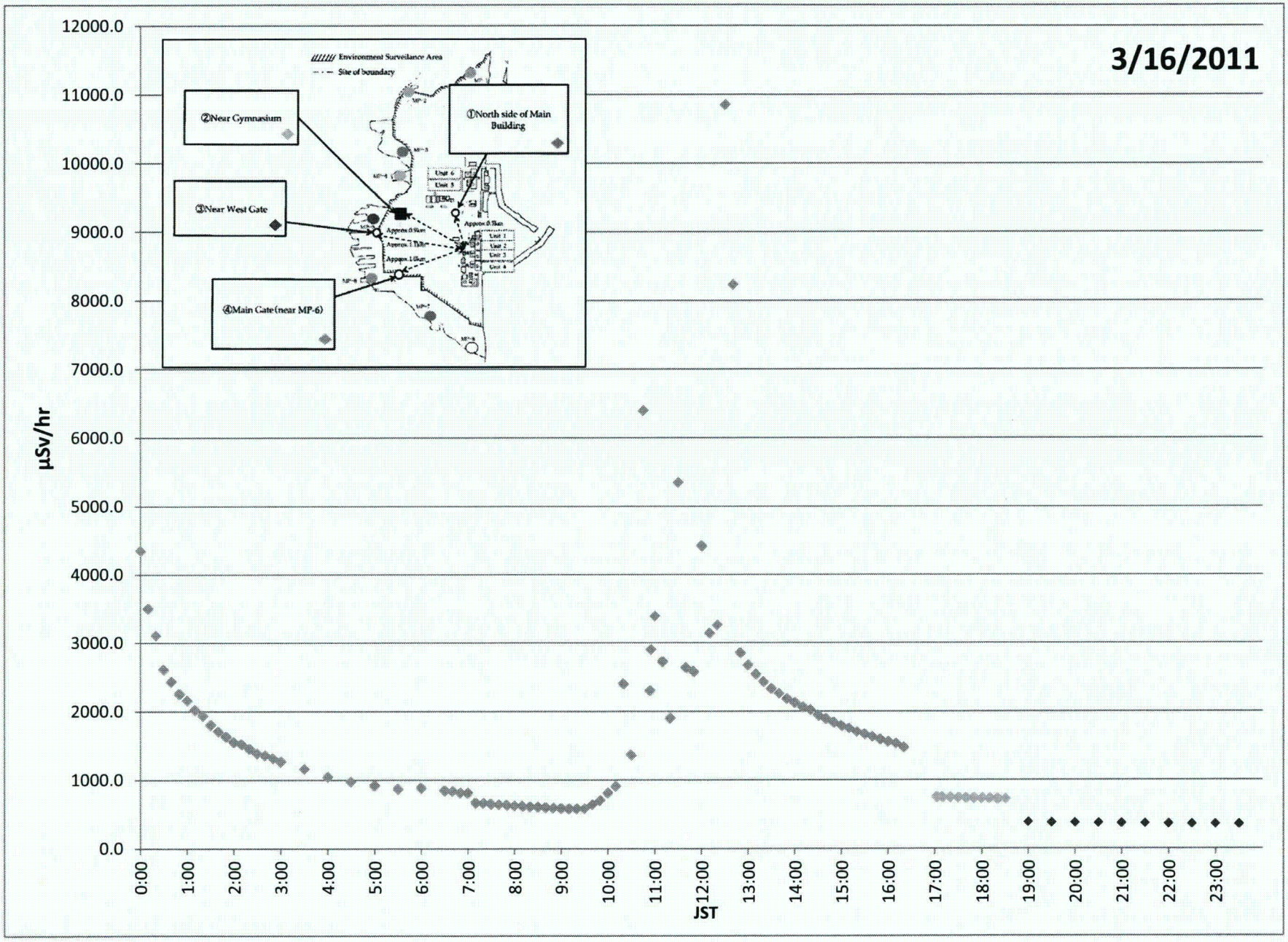
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate (near MP-6)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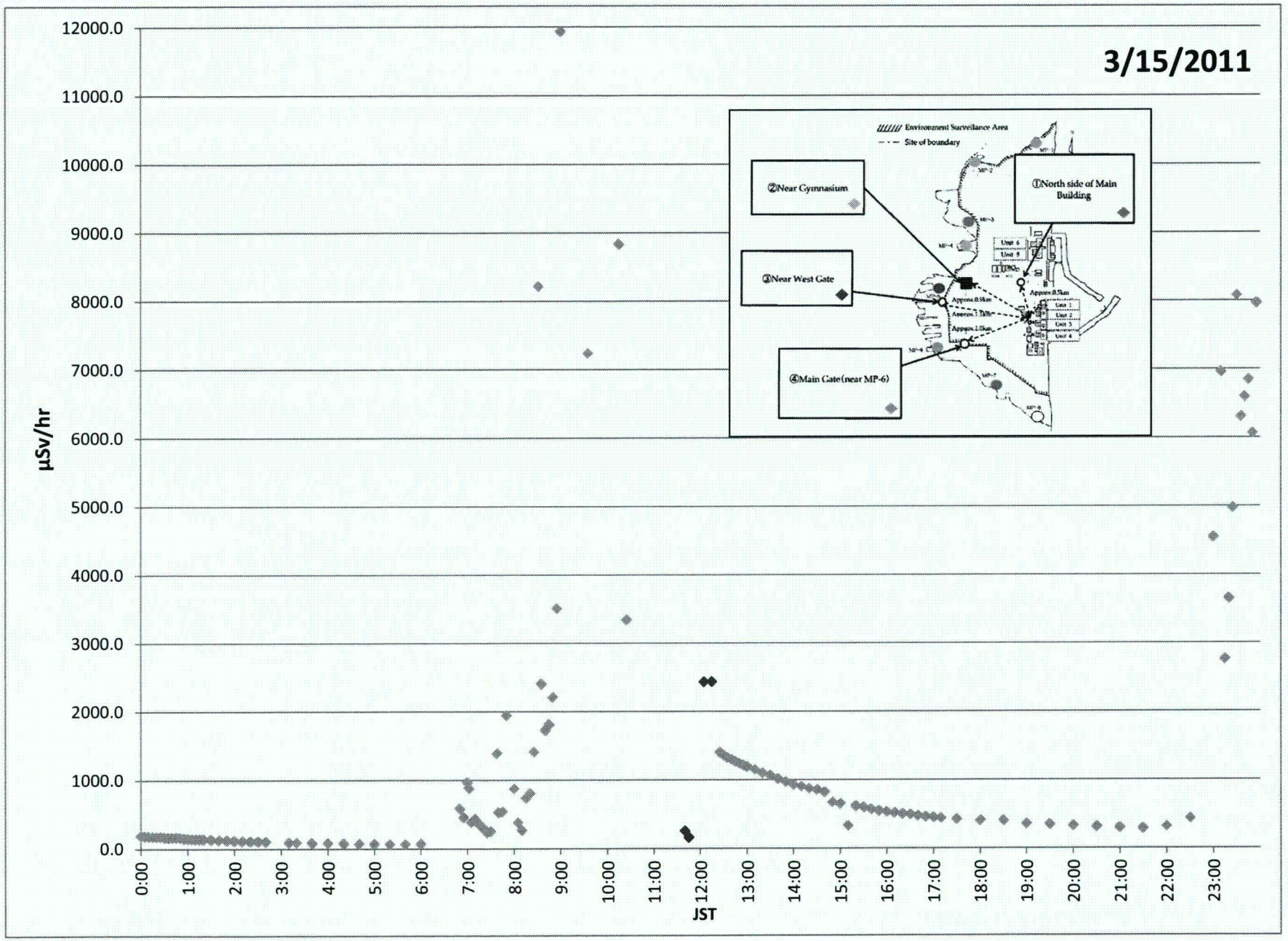
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate(near MP-6)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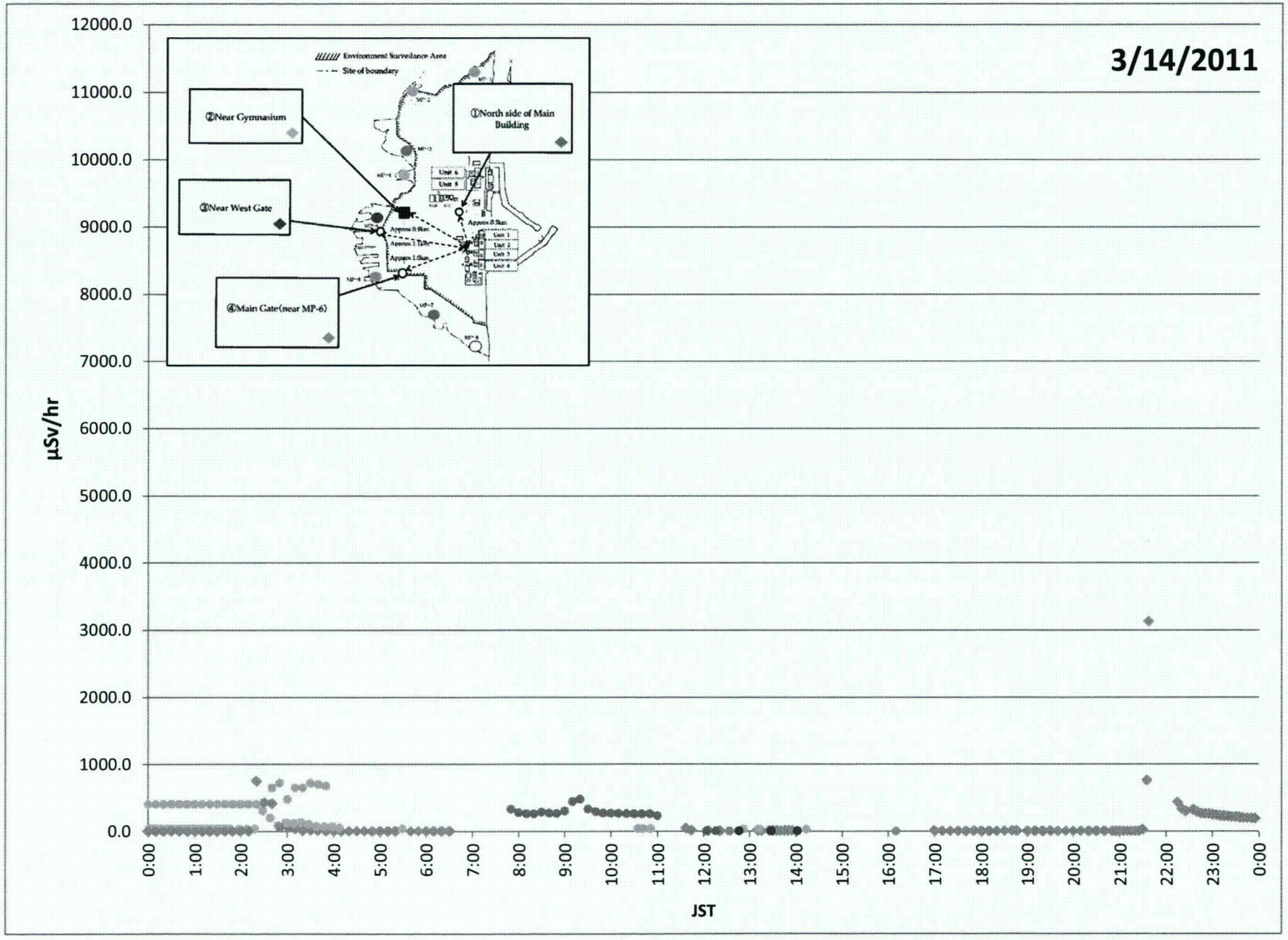
JST
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate(near MP-6)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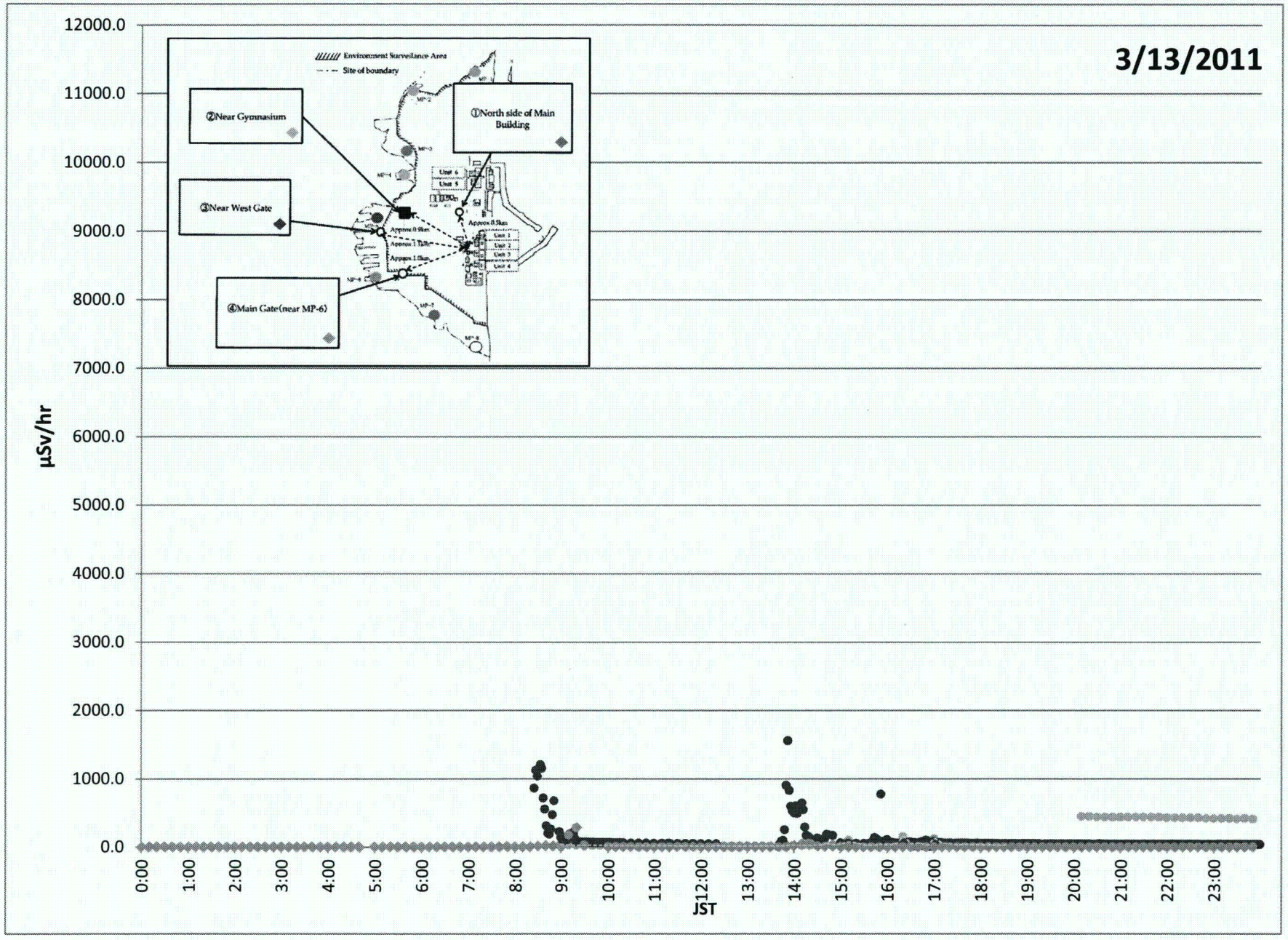
JST
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate(near MP-6)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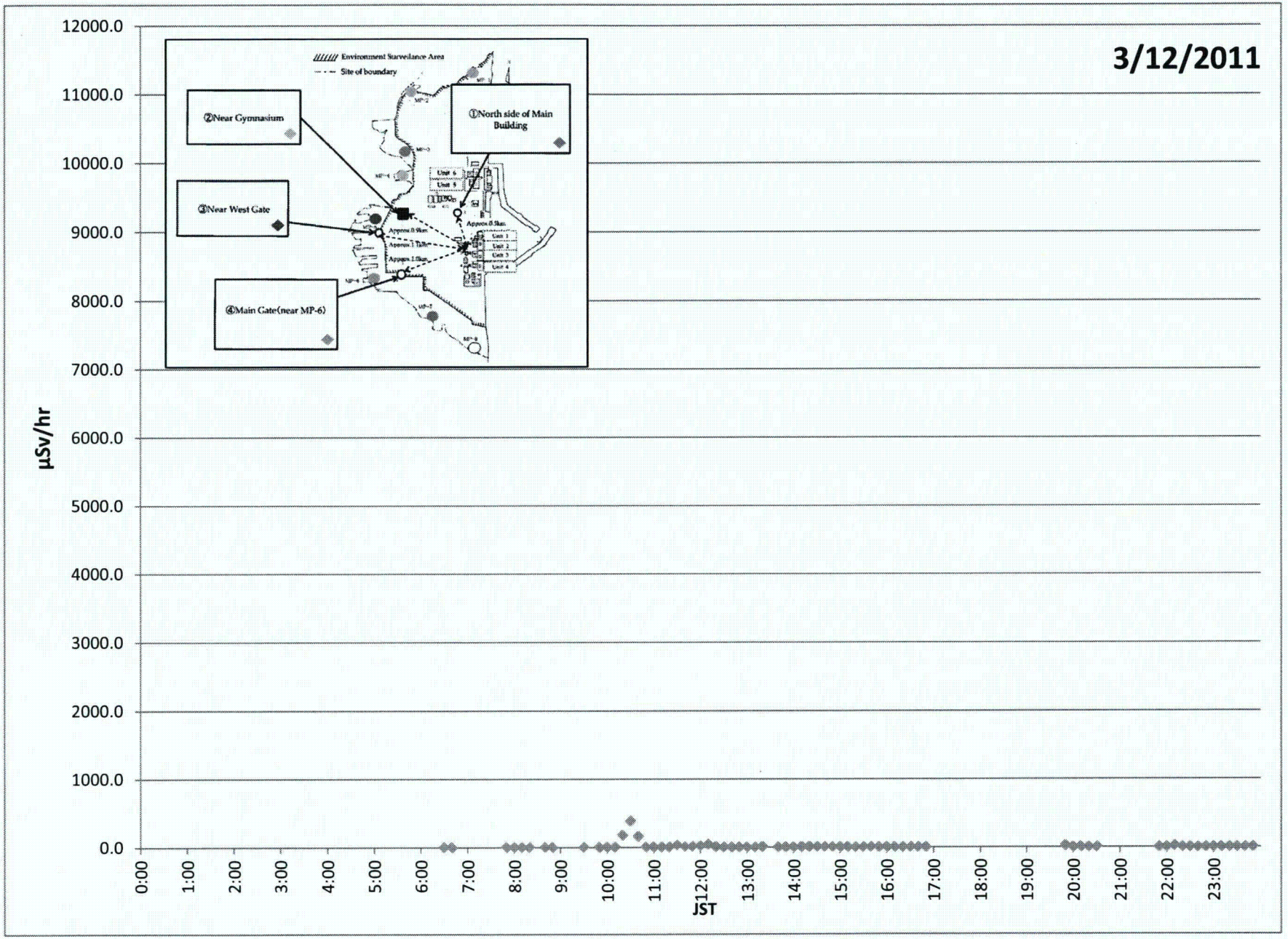
JST
Environment Surveillance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate(near MP-6)
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
Unit 6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JST
Environment Surveilance Area
Site of boundary
②Near Gymnasium
①North side of Main Building
③Near West Gate
④Main Gate(near MP-6)
Unit 6
Unit 5
Unit 1
Unit 2
Unit 3
Unit 4
Approx.0.9km
Approx.0.8km
Approx.1.7km
Approx.1.5km

Date	Axis Time	Time	MS 1	MS 2	MS 3	MS 4	MP 1
3/12/2011	3/12/11 0:00	0:00					
3/12/2011	3/12/11 0:10	0:10					
3/12/2011	3/12/11 0:20	0:20					
3/12/2011	3/12/11 0:30	0:30					
3/12/2011	3/12/11 0:40	0:40					
3/12/2011	3/12/11 0:50	0:50					
3/12/2011	3/12/11 1:00	1:00					
3/12/2011	3/12/11 1:10	1:10					
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3/12/2011	3/12/11 1:40	1:40					
3/12/2011	3/12/11 1:50	1:50					
3/12/2011	3/12/11 2:00	2:00					
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3/12/2011	3/12/11 3:00	3:00					
3/12/2011	3/12/11 3:10	3:10					
3/12/2011	3/12/11 3:20	3:20					
3/12/2011	3/12/11 3:30	3:30					
3/12/2011	3/12/11 3:40	3:40					
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3/12/2011	3/12/11 4:00	4:00					
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3/12/2011	3/12/11 6:20	6:20					
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3/12/2011	3/12/11 6:40	6:40				4.9	
3/12/2011	3/12/11 6:50	6:50					
3/12/2011	3/12/11 7:00	7:00					
3/12/2011	3/12/11 7:10	7:10					
3/12/2011	3/12/11 7:20	7:20					
3/12/2011	3/12/11 7:30	7:30					

3/12/2011	3/12/11 7:40	7:40					
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3/12/2011	3/12/11 8:50	8:50				4.9	
3/12/2011	3/12/11 9:00	9:00					
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3/13/2011	3/13/11 1:10	1:10				3.2	
3/13/2011	3/13/11 1:20	1:20				3.2	
3/13/2011	3/13/11 1:30	1:30				3.1	
3/13/2011	3/13/11 1:40	1:40				3.3	
3/13/2011	3/13/11 1:50	1:50				3.1	
3/13/2011	3/13/11 2:00	2:00				3.2	
3/13/2011	3/13/11 2:10	2:10				3.1	
3/13/2011	3/13/11 2:20	2:20				3.2	
3/13/2011	3/13/11 2:30	2:30				3.2	
3/13/2011	3/13/11 2:40	2:40				3.1	
3/13/2011	3/13/11 2:50	2:50				3.1	
3/13/2011	3/13/11 3:00	3:00				3.6	
3/13/2011	3/13/11 3:10	3:10				4.0	
3/13/2011	3/13/11 3:20	3:20				3.2	
3/13/2011	3/13/11 3:30	3:30				3.1	
3/13/2011	3/13/11 3:40	3:40				3.4	
3/13/2011	3/13/11 3:50	3:50				3.2	
3/13/2011	3/13/11 4:00	4:00				3.0	
3/13/2011	3/13/11 4:10	4:10				3.6	
3/13/2011	3/13/11 4:20	4:20				3.2	
3/13/2011	3/13/11 4:30	4:30				3.1	
3/13/2011	3/13/11 4:40	4:40				3.3	
3/13/2011	3/13/11 4:50	4:50					
3/13/2011	3/13/11 5:00	5:00				3.2	
3/13/2011	3/13/11 5:10	5:10				3.4	
3/13/2011	3/13/11 5:20	5:20				3.5	
3/13/2011	3/13/11 5:30	5:30				3.8	
3/13/2011	3/13/11 5:40	5:40				3.2	
3/13/2011	3/13/11 5:50	5:50				3.2	
3/13/2011	3/13/11 6:00	6:00				3.5	
3/13/2011	3/13/11 6:10	6:10				3.2	
3/13/2011	3/13/11 6:20	6:20				3.2	
3/13/2011	3/13/11 6:30	6:30				3.6	
3/13/2011	3/13/11 6:40	6:40				3.1	
3/13/2011	3/13/11 6:50	6:50				3.0	
3/13/2011	3/13/11 7:00	7:00				3.7	

3/13/2011	3/13/11 7:10	7:10				3.4	
3/13/2011	3/13/11 7:20	7:20				3.3	
3/13/2011	3/13/11 7:30	7:30				3.5	
3/13/2011	3/13/11 7:40	7:40				3.4	
3/13/2011	3/13/11 7:50	7:50				7.2	
3/13/2011	3/13/11 8:00	8:00				3.5	
3/13/2011	3/13/11 8:10	8:10				3.2	
3/13/2011	3/13/11 8:20	8:20				3.2	
3/13/2011	3/13/11 8:25	8:25					
3/13/2011	3/13/11 8:27	8:27					
3/13/2011	3/13/11 8:29	8:29					
3/13/2011	3/13/11 8:30	8:30				14.7	
3/13/2011	3/13/11 8:31	8:31					
3/13/2011	3/13/11 8:33	8:33					
3/13/2011	3/13/11 8:35	8:35					
3/13/2011	3/13/11 8:37	8:37					
3/13/2011	3/13/11 8:39	8:39					
3/13/2011	3/13/11 8:40	8:40				16.0	
3/13/2011	3/13/11 8:41	8:41					
3/13/2011	3/13/11 8:43	8:43					
3/13/2011	3/13/11 8:45	8:45					
3/13/2011	3/13/11 8:47	8:47					
3/13/2011	3/13/11 8:49	8:49					
3/13/2011	3/13/11 8:50	8:50				15.9	
3/13/2011	3/13/11 8:51	8:51					
3/13/2011	3/13/11 8:58	8:58					
3/13/2011	3/13/11 9:00	9:00				10.2	37.0
3/13/2011	3/13/11 9:02	9:02					
3/13/2011	3/13/11 9:04	9:04					
3/13/2011	3/13/11 9:06	9:06					
3/13/2011	3/13/11 9:08	9:08					
3/13/2011	3/13/11 9:10	9:10				175.0	30.0
3/13/2011	3/13/11 9:12	9:12					
3/13/2011	3/13/11 9:14	9:14					
3/13/2011	3/13/11 9:16	9:16					
3/13/2011	3/13/11 9:18	9:18					
3/13/2011	3/13/11 9:20	9:20				281.7	27.0
3/13/2011	3/13/11 9:22	9:22					
3/13/2011	3/13/11 9:24	9:24					
3/13/2011	3/13/11 9:26	9:26					
3/13/2011	3/13/11 9:28	9:28					
3/13/2011	3/13/11 9:30	9:30				26.0	25.0
3/13/2011	3/13/11 9:32	9:32					
3/13/2011	3/13/11 9:34	9:34					
3/13/2011	3/13/11 9:36	9:36					
3/13/2011	3/13/11 9:38	9:38					
3/13/2011	3/13/11 9:40	9:40					25.0

3/13/2011	3/13/11 9:42	9:42					
3/13/2011	3/13/11 9:44	9:44					
3/13/2011	3/13/11 9:46	9:46					
3/13/2011	3/13/11 9:48	9:48					
3/13/2011	3/13/11 9:50	9:50					23.0
3/13/2011	3/13/11 9:52	9:52					
3/13/2011	3/13/11 9:54	9:54					
3/13/2011	3/13/11 9:56	9:56					
3/13/2011	3/13/11 9:58	9:58					
3/13/2011	3/13/11 10:00	10:00				6.5	23.0
3/13/2011	3/13/11 10:02	10:02					
3/13/2011	3/13/11 10:04	10:04					
3/13/2011	3/13/11 10:06	10:06					
3/13/2011	3/13/11 10:08	10:08					
3/13/2011	3/13/11 10:10	10:10				6.4	20.0
3/13/2011	3/13/11 10:12	10:12					
3/13/2011	3/13/11 10:14	10:14					
3/13/2011	3/13/11 10:16	10:16					
3/13/2011	3/13/11 10:20	10:20				8.3	20.0
3/13/2011	3/13/11 10:30	10:30				6.8	19.0
3/13/2011	3/13/11 10:40	10:40				6.0	19.0
3/13/2011	3/13/11 10:50	10:50				6.0	19.0
3/13/2011	3/13/11 11:00	11:00				5.8	18.0
3/13/2011	3/13/11 11:10	11:10				5.6	18.0
3/13/2011	3/13/11 11:18	11:18					
3/13/2011	3/13/11 11:20	11:20				6.0	18.0
3/13/2011	3/13/11 11:30	11:30				7.9	17.0
3/13/2011	3/13/11 11:40	11:40				6.8	17.0
3/13/2011	3/13/11 11:50	11:50				6.6	17.0
3/13/2011	3/13/11 12:00	12:00				5.5	17.0
3/13/2011	3/13/11 12:10	12:10				5.5	18.0
3/13/2011	3/13/11 12:20	12:20				5.3	18.0
3/13/2011	3/13/11 12:30	12:30				5.5	17.0
3/13/2011	3/13/11 12:40	12:40				5.3	17.0
3/13/2011	3/13/11 12:50	12:50				5.4	17.0
3/13/2011	3/13/11 13:00	13:00				5.0	17.0
3/13/2011	3/13/11 13:10	13:10				4.8	17.0
3/13/2011	3/13/11 13:20	13:20				4.9	17.0
3/13/2011	3/13/11 13:30	13:30				4.9	16.0
3/13/2011	3/13/11 13:40	13:40				4.9	16.0
3/13/2011	3/13/11 13:42	13:42					
3/13/2011	3/13/11 13:44	13:44					
3/13/2011	3/13/11 13:46	13:46					
3/13/2011	3/13/11 13:48	13:48					
3/13/2011	3/13/11 13:50	13:50				5.0	24.0
3/13/2011	3/13/11 13:52	13:52					
3/13/2011	3/13/11 13:54	13:54					

3/13/2011	3/13/11 13:56	13:56					
3/13/2011	3/13/11 13:58	13:58					
3/13/2011	3/13/11 14:00	14:00				21.9	25.0
3/13/2011	3/13/11 14:02	14:02					
3/13/2011	3/13/11 14:04	14:04					
3/13/2011	3/13/11 14:06	14:06					
3/13/2011	3/13/11 14:08	14:08					
3/13/2011	3/13/11 14:10	14:10				39.7	21.0
3/13/2011	3/13/11 14:12	14:12					
3/13/2011	3/13/11 14:14	14:14					
3/13/2011	3/13/11 14:16	14:16					
3/13/2011	3/13/11 14:18	14:18					
3/13/2011	3/13/11 14:20	14:20				57.6	21.0
3/13/2011	3/13/11 14:30	14:30				17.6	32.0
3/13/2011	3/13/11 14:38	14:38					
3/13/2011	3/13/11 14:40	14:40				10.1	52.0
3/13/2011	3/13/11 14:42	14:42					
3/13/2011	3/13/11 14:44	14:44					
3/13/2011	3/13/11 14:50	14:50				10.9	35.0
3/13/2011	3/13/11 15:00	15:00				8.3	52.0
3/13/2011	3/13/11 15:10	15:10				5.7	100.0
3/13/2011	3/13/11 15:20	15:20				4.7	24.0
3/13/2011	3/13/11 15:30	15:30				4.5	34.0
3/13/2011	3/13/11 15:36	15:36					
3/13/2011	3/13/11 15:38	15:38					
3/13/2011	3/13/11 15:40	15:40				4.4	24.0
3/13/2011	3/13/11 15:42	15:42					
3/13/2011	3/13/11 15:44	15:44					
3/13/2011	3/13/11 15:46	15:46					
3/13/2011	3/13/11 15:48	15:48					
3/13/2011	3/13/11 15:50	15:50				5.5	39.0
3/13/2011	3/13/11 15:52	15:52					
3/13/2011	3/13/11 15:54	15:54					
3/13/2011	3/13/11 15:56	15:56					
3/13/2011	3/13/11 15:58	15:58					
3/13/2011	3/13/11 16:00	16:00				5.2	31.0
3/13/2011	3/13/11 16:02	16:02					
3/13/2011	3/13/11 16:04	16:04					
3/13/2011	3/13/11 16:06	16:06					
3/13/2011	3/13/11 16:08	16:08					
3/13/2011	3/13/11 16:10	16:10				4.6	45.0
3/13/2011	3/13/11 16:12	16:12					
3/13/2011	3/13/11 16:14	16:14					
3/13/2011	3/13/11 16:16	16:16					
3/13/2011	3/13/11 16:18	16:18					
3/13/2011	3/13/11 16:20	16:20				4.3	150.0
3/13/2011	3/13/11 16:22	16:22					

3/13/2011	3/13/11 16:24	16:24					
3/13/2011	3/13/11 16:26	16:26					
3/13/2011	3/13/11 16:28	16:28					
3/13/2011	3/13/11 16:30	16:30				4.3	46.0
3/13/2011	3/13/11 16:32	16:32					
3/13/2011	3/13/11 16:34	16:34					
3/13/2011	3/13/11 16:36	16:36					
3/13/2011	3/13/11 16:38	16:38					
3/13/2011	3/13/11 16:40	16:40				4.2	60.0
3/13/2011	3/13/11 16:42	16:42					
3/13/2011	3/13/11 16:44	16:44					
3/13/2011	3/13/11 16:46	16:46					
3/13/2011	3/13/11 16:48	16:48					
3/13/2011	3/13/11 16:50	16:50				4.2	30.0
3/13/2011	3/13/11 16:52	16:52					
3/13/2011	3/13/11 16:54	16:54					
3/13/2011	3/13/11 16:56	16:56					
3/13/2011	3/13/11 16:58	16:58					
3/13/2011	3/13/11 17:00	17:00				4.3	120.0
3/13/2011	3/13/11 17:02	17:02					
3/13/2011	3/13/11 17:04	17:04					
3/13/2011	3/13/11 17:06	17:06					
3/13/2011	3/13/11 17:08	17:08					
3/13/2011	3/13/11 17:10	17:10				4.2	62.0
3/13/2011	3/13/11 17:12	17:12					
3/13/2011	3/13/11 17:14	17:14					
3/13/2011	3/13/11 17:16	17:16					
3/13/2011	3/13/11 17:18	17:18					
3/13/2011	3/13/11 17:20	17:20				4.6	45.0
3/13/2011	3/13/11 17:22	17:22					
3/13/2011	3/13/11 17:24	17:24					
3/13/2011	3/13/11 17:26	17:26					
3/13/2011	3/13/11 17:28	17:28					
3/13/2011	3/13/11 17:30	17:30				5.2	36.0
3/13/2011	3/13/11 17:32	17:32					
3/13/2011	3/13/11 17:34	17:34					
3/13/2011	3/13/11 17:36	17:36					
3/13/2011	3/13/11 17:38	17:38					
3/13/2011	3/13/11 17:40	17:40				5.9	40.0
3/13/2011	3/13/11 17:42	17:42					
3/13/2011	3/13/11 17:44	17:44					
3/13/2011	3/13/11 17:46	17:46					
3/13/2011	3/13/11 17:48	17:48					
3/13/2011	3/13/11 17:50	17:50				6.0	35.0
3/13/2011	3/13/11 17:52	17:52					
3/13/2011	3/13/11 17:54	17:54					
3/13/2011	3/13/11 17:56	17:56					

3/13/2011	3/13/11 17:58	17:58					
3/13/2011	3/13/11 18:00	18:00				5.4	35.0
3/13/2011	3/13/11 18:02	18:02					
3/13/2011	3/13/11 18:04	18:04					
3/13/2011	3/13/11 18:06	18:06					
3/13/2011	3/13/11 18:08	18:08					
3/13/2011	3/13/11 18:10	18:10				5.2	30.0
3/13/2011	3/13/11 18:12	18:12					
3/13/2011	3/13/11 18:14	18:14					
3/13/2011	3/13/11 18:16	18:16					
3/13/2011	3/13/11 18:18	18:18					
3/13/2011	3/13/11 18:20	18:20				5.3	27.0
3/13/2011	3/13/11 18:22	18:22					
3/13/2011	3/13/11 18:24	18:24					
3/13/2011	3/13/11 18:26	18:26					
3/13/2011	3/13/11 18:28	18:28					
3/13/2011	3/13/11 18:30	18:30				4.9	26.0
3/13/2011	3/13/11 18:32	18:32					
3/13/2011	3/13/11 18:34	18:34					
3/13/2011	3/13/11 18:36	18:36					
3/13/2011	3/13/11 18:38	18:38					
3/13/2011	3/13/11 18:40	18:40				5.0	
3/13/2011	3/13/11 18:42	18:42					
3/13/2011	3/13/11 18:44	18:44					
3/13/2011	3/13/11 18:46	18:46					
3/13/2011	3/13/11 18:48	18:48					
3/13/2011	3/13/11 18:50	18:50				4.8	
3/13/2011	3/13/11 18:52	18:52					
3/13/2011	3/13/11 18:54	18:54					
3/13/2011	3/13/11 18:56	18:56					
3/13/2011	3/13/11 18:58	18:58					
3/13/2011	3/13/11 19:00	19:00				5.2	
3/13/2011	3/13/11 19:02	19:02					
3/13/2011	3/13/11 19:04	19:04					
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3/13/2011	3/13/11 19:08	19:08					
3/13/2011	3/13/11 19:10	19:10				5.1	
3/13/2011	3/13/11 19:12	19:12					
3/13/2011	3/13/11 19:14	19:14					
3/13/2011	3/13/11 19:16	19:16					
3/13/2011	3/13/11 19:20	19:20				4.7	
3/13/2011	3/13/11 19:23	19:23					
3/13/2011	3/13/11 19:25	19:25					
3/13/2011	3/13/11 19:27	19:27					
3/13/2011	3/13/11 19:29	19:29					
3/13/2011	3/13/11 19:30	19:30				4.6	
3/13/2011	3/13/11 19:31	19:31					

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3/13/2011	3/13/11 19:35	19:35					
3/13/2011	3/13/11 19:37	19:37					
3/13/2011	3/13/11 19:39	19:39					
3/13/2011	3/13/11 19:40	19:40				4.8	
3/13/2011	3/13/11 19:41	19:41					
3/13/2011	3/13/11 19:43	19:43					
3/13/2011	3/13/11 19:45	19:45					
3/13/2011	3/13/11 19:47	19:47					
3/13/2011	3/13/11 19:49	19:49					
3/13/2011	3/13/11 19:50	19:50				5.6	
3/13/2011	3/13/11 19:51	19:51					
3/13/2011	3/13/11 19:53	19:53					
3/13/2011	3/13/11 19:55	19:55					
3/13/2011	3/13/11 19:57	19:57					
3/13/2011	3/13/11 19:59	19:59					
3/13/2011	3/13/11 20:00	20:00				5.7	
3/13/2011	3/13/11 20:01	20:01					
3/13/2011	3/13/11 20:03	20:03					
3/13/2011	3/13/11 20:05	20:05					
3/13/2011	3/13/11 20:07	20:07					
3/13/2011	3/13/11 20:09	20:09					
3/13/2011	3/13/11 20:10	20:10				4.5	
3/13/2011	3/13/11 20:11	20:11					
3/13/2011	3/13/11 20:13	20:13					
3/13/2011	3/13/11 20:15	20:15					
3/13/2011	3/13/11 20:17	20:17					
3/13/2011	3/13/11 20:19	20:19					
3/13/2011	3/13/11 20:20	20:20				4.5	
3/13/2011	3/13/11 20:21	20:21					
3/13/2011	3/13/11 20:23	20:23					
3/13/2011	3/13/11 20:25	20:25					
3/13/2011	3/13/11 20:27	20:27					
3/13/2011	3/13/11 20:29	20:29					
3/13/2011	3/13/11 20:30	20:30				4.4	
3/13/2011	3/13/11 20:31	20:31					
3/13/2011	3/13/11 20:33	20:33					
3/13/2011	3/13/11 20:35	20:35					
3/13/2011	3/13/11 20:37	20:37					
3/13/2011	3/13/11 20:39	20:39					
3/13/2011	3/13/11 20:40	20:40				4.5	
3/13/2011	3/13/11 20:41	20:41					
3/13/2011	3/13/11 20:43	20:43					
3/13/2011	3/13/11 20:45	20:45					
3/13/2011	3/13/11 20:47	20:47					
3/13/2011	3/13/11 20:49	20:49					
3/13/2011	3/13/11 20:50	20:50				4.4	

3/13/2011	3/13/11 20:51	20:51					
3/13/2011	3/13/11 20:53	20:53					
3/13/2011	3/13/11 20:55	20:55					
3/13/2011	3/13/11 20:57	20:57					
3/13/2011	3/13/11 20:59	20:59					
3/13/2011	3/13/11 21:00	21:00				4.4	
3/13/2011	3/13/11 21:01	21:01					
3/13/2011	3/13/11 21:03	21:03					
3/13/2011	3/13/11 21:05	21:05					
3/13/2011	3/13/11 21:07	21:07					
3/13/2011	3/13/11 21:09	21:09					
3/13/2011	3/13/11 21:10	21:10				4.5	
3/13/2011	3/13/11 21:11	21:11					
3/13/2011	3/13/11 21:13	21:13					
3/13/2011	3/13/11 21:15	21:15					
3/13/2011	3/13/11 21:17	21:17					
3/13/2011	3/13/11 21:19	21:19					
3/13/2011	3/13/11 21:20	21:20				4.5	
3/13/2011	3/13/11 21:21	21:21					
3/13/2011	3/13/11 21:23	21:23					
3/13/2011	3/13/11 21:25	21:25					
3/13/2011	3/13/11 21:27	21:27					
3/13/2011	3/13/11 21:29	21:29					
3/13/2011	3/13/11 21:30	21:30				4.6	
3/13/2011	3/13/11 21:31	21:31					
3/13/2011	3/13/11 21:33	21:33					
3/13/2011	3/13/11 21:35	21:35					
3/13/2011	3/13/11 21:37	21:37					
3/13/2011	3/13/11 21:39	21:39					
3/13/2011	3/13/11 21:40	21:40				4.8	
3/13/2011	3/13/11 21:41	21:41					
3/13/2011	3/13/11 21:43	21:43					
3/13/2011	3/13/11 21:45	21:45					
3/13/2011	3/13/11 21:47	21:47					
3/13/2011	3/13/11 21:49	21:49					
3/13/2011	3/13/11 21:50	21:50				4.6	
3/13/2011	3/13/11 21:51	21:51					
3/13/2011	3/13/11 21:53	21:53					
3/13/2011	3/13/11 21:55	21:55					
3/13/2011	3/13/11 21:57	21:57					
3/13/2011	3/13/11 21:59	21:59					
3/13/2011	3/13/11 22:00	22:00				4.6	
3/13/2011	3/13/11 22:01	22:01					
3/13/2011	3/13/11 22:03	22:03					
3/13/2011	3/13/11 22:05	22:05					
3/13/2011	3/13/11 22:07	22:07					
3/13/2011	3/13/11 22:09	22:09					

3/13/2011	3/13/11 22:10	22:10				4.6	
3/13/2011	3/13/11 22:11	22:11					
3/13/2011	3/13/11 22:13	22:13					
3/13/2011	3/13/11 22:15	22:15					
3/13/2011	3/13/11 22:17	22:17					
3/13/2011	3/13/11 22:19	22:19					
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3/13/2011	3/13/11 22:21	22:21					
3/13/2011	3/13/11 22:23	22:23					
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3/13/2011	3/13/11 22:29	22:29					
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3/13/2011	3/13/11 22:31	22:31					
3/13/2011	3/13/11 22:33	22:33					
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3/13/2011	3/13/11 22:37	22:37					
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3/13/2011	3/13/11 22:41	22:41					
3/13/2011	3/13/11 22:43	22:43					
3/13/2011	3/13/11 22:45	22:45					
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3/13/2011	3/13/11 22:49	22:49					
3/13/2011	3/13/11 22:50	22:50				4.6	
3/13/2011	3/13/11 22:51	22:51					
3/13/2011	3/13/11 22:53	22:53					
3/13/2011	3/13/11 22:55	22:55					
3/13/2011	3/13/11 22:57	22:57					
3/13/2011	3/13/11 22:59	22:59					
3/13/2011	3/13/11 23:00	23:00				4.7	
3/13/2011	3/13/11 23:01	23:01					
3/13/2011	3/13/11 23:03	23:03					
3/13/2011	3/13/11 23:05	23:05					
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3/13/2011	3/13/11 23:09	23:09					
3/13/2011	3/13/11 23:10	23:10				4.7	
3/13/2011	3/13/11 23:11	23:11					
3/13/2011	3/13/11 23:13	23:13					
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3/13/2011	3/13/11 23:19	23:19					
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3/13/2011	3/13/11 23:25	23:25					
3/13/2011	3/13/11 23:27	23:27					

3/13/2011	3/13/11 23:29	23:29					
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3/13/2011	3/13/11 23:35	23:35					
3/13/2011	3/13/11 23:37	23:37					
3/13/2011	3/13/11 23:39	23:39					
3/13/2011	3/13/11 23:40	23:40				4.8	
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3/13/2011	3/13/11 23:49	23:49					
3/13/2011	3/13/11 23:50	23:50				4.9	
3/13/2011	3/13/11 23:51	23:51					
3/13/2011	3/13/11 23:53	23:53					
3/13/2011	3/13/11 23:55	23:55					
3/13/2011	3/13/11 23:57	23:57					
3/13/2011	3/13/11 23:59	23:59					
3/14/2011	3/14/11 0:00	0:00				4.9	
3/14/2011	3/14/11 0:01	0:01					
3/14/2011	3/14/11 0:03	0:03					
3/14/2011	3/14/11 0:05	0:05					
3/14/2011	3/14/11 0:07	0:07					
3/14/2011	3/14/11 0:09	0:09					
3/14/2011	3/14/11 0:10	0:10				4.5	
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3/14/2011	3/14/11 0:13	0:13					
3/14/2011	3/14/11 0:15	0:15					
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3/14/2011	3/14/11 0:19	0:19					
3/14/2011	3/14/11 0:20	0:20				4.6	
3/14/2011	3/14/11 0:21	0:21					
3/14/2011	3/14/11 0:23	0:23					
3/14/2011	3/14/11 0:25	0:25					
3/14/2011	3/14/11 0:27	0:27					
3/14/2011	3/14/11 0:29	0:29					
3/14/2011	3/14/11 0:30	0:30				4.5	
3/14/2011	3/14/11 0:31	0:31					
3/14/2011	3/14/11 0:33	0:33					
3/14/2011	3/14/11 0:35	0:35					
3/14/2011	3/14/11 0:37	0:37					
3/14/2011	3/14/11 0:39	0:39					
3/14/2011	3/14/11 0:40	0:40				4.5	
3/14/2011	3/14/11 0:41	0:41					
3/14/2011	3/14/11 0:43	0:43					
3/14/2011	3/14/11 0:45	0:45					

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3/14/2011	3/14/11 0:49	0:49					
3/14/2011	3/14/11 0:50	0:50				4.4	
3/14/2011	3/14/11 0:51	0:51					
3/14/2011	3/14/11 0:53	0:53					
3/14/2011	3/14/11 0:55	0:55					
3/14/2011	3/14/11 0:57	0:57					
3/14/2011	3/14/11 0:59	0:59					
3/14/2011	3/14/11 1:00	1:00				4.4	
3/14/2011	3/14/11 1:01	1:01					
3/14/2011	3/14/11 1:03	1:03					
3/14/2011	3/14/11 1:05	1:05					
3/14/2011	3/14/11 1:07	1:07					
3/14/2011	3/14/11 1:09	1:09					
3/14/2011	3/14/11 1:10	1:10				4.4	
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3/14/2011	3/14/11 1:15	1:15					
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3/14/2011	3/14/11 1:19	1:19					
3/14/2011	3/14/11 1:20	1:20				4.3	
3/14/2011	3/14/11 1:21	1:21					
3/14/2011	3/14/11 1:23	1:23					
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3/14/2011	3/14/11 1:27	1:27					
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3/14/2011	3/14/11 1:31	1:31					
3/14/2011	3/14/11 1:33	1:33					
3/14/2011	3/14/11 1:35	1:35					
3/14/2011	3/14/11 1:37	1:37					
3/14/2011	3/14/11 1:39	1:39					
3/14/2011	3/14/11 1:40	1:40				4.3	
3/14/2011	3/14/11 1:41	1:41					
3/14/2011	3/14/11 1:43	1:43					
3/14/2011	3/14/11 1:45	1:45					
3/14/2011	3/14/11 1:47	1:47					
3/14/2011	3/14/11 1:50	1:50				4.4	
3/14/2011	3/14/11 1:58	1:58					
3/14/2011	3/14/11 2:00	2:00				4.4	
3/14/2011	3/14/11 2:08	2:08					
3/14/2011	3/14/11 2:10	2:10				4.6	
3/14/2011	3/14/11 2:18	2:18					
3/14/2011	3/14/11 2:20	2:20				751.2	
3/14/2011	3/14/11 2:28	2:28					
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3/14/2011	3/14/11 2:38	2:38					

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3/14/2011	3/14/11 2:58	2:58					
3/14/2011	3/14/11 3:00	3:00				65.5	
3/14/2011	3/14/11 3:08	3:08					
3/14/2011	3/14/11 3:10	3:10				45.5	
3/14/2011	3/14/11 3:18	3:18					
3/14/2011	3/14/11 3:20	3:20				15.4	
3/14/2011	3/14/11 3:28	3:28					
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3/14/2011	3/14/11 3:38	3:38					
3/14/2011	3/14/11 3:40	3:40				15.0	
3/14/2011	3/14/11 3:48	3:48					
3/14/2011	3/14/11 3:50	3:50				10.3	
3/14/2011	3/14/11 3:58	3:58					
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3/14/2011	3/14/11 4:08	4:08					
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3/14/2011	3/14/11 4:20	4:20				7.7	
3/14/2011	3/14/11 4:30	4:30				7.7	
3/14/2011	3/14/11 4:40	4:40				7.0	
3/14/2011	3/14/11 4:50	4:50				6.9	
3/14/2011	3/14/11 5:00	5:00				6.7	
3/14/2011	3/14/11 5:10	5:10				6.5	
3/14/2011	3/14/11 5:20	5:20				6.7	
3/14/2011	3/14/11 5:29	5:29					
3/14/2011	3/14/11 5:30	5:30					
3/14/2011	3/14/11 5:40	5:40				6.4	
3/14/2011	3/14/11 5:50	5:50				6.3	
3/14/2011	3/14/11 6:00	6:00				5.1	
3/14/2011	3/14/11 6:10	6:10				5.0	
3/14/2011	3/14/11 6:20	6:20				5.0	
3/14/2011	3/14/11 6:30	6:30				4.9	
3/14/2011	3/14/11 6:40	6:40					
3/14/2011	3/14/11 6:50	6:50					
3/14/2011	3/14/11 7:00	7:00					
3/14/2011	3/14/11 7:10	7:10					
3/14/2011	3/14/11 7:20	7:20					
3/14/2011	3/14/11 7:30	7:30					
3/14/2011	3/14/11 7:40	7:40					
3/14/2011	3/14/11 7:50	7:50					
3/14/2011	3/14/11 8:00	8:00					
3/14/2011	3/14/11 8:10	8:10					
3/14/2011	3/14/11 8:20	8:20					
3/14/2011	3/14/11 8:30	8:30					
3/14/2011	3/14/11 8:40	8:40					

3/14/2011	3/14/11 8:50	8:50					
3/14/2011	3/14/11 9:00	9:00					
3/14/2011	3/14/11 9:10	9:10					
3/14/2011	3/14/11 9:20	9:20					
3/14/2011	3/14/11 9:30	9:30					
3/14/2011	3/14/11 9:40	9:40					
3/14/2011	3/14/11 9:50	9:50					
3/14/2011	3/14/11 10:00	10:00					
3/14/2011	3/14/11 10:10	10:10					
3/14/2011	3/14/11 10:20	10:20					
3/14/2011	3/14/11 10:30	10:30					
3/14/2011	3/14/11 10:35	10:35					
3/14/2011	3/14/11 10:40	10:40					
3/14/2011	3/14/11 10:41	10:41					
3/14/2011	3/14/11 10:50	10:50					
3/14/2011	3/14/11 10:51	10:51					
3/14/2011	3/14/11 11:00	11:00					
3/14/2011	3/14/11 11:10	11:10					
3/14/2011	3/14/11 11:20	11:20					
3/14/2011	3/14/11 11:30	11:30					
3/14/2011	3/14/11 11:37	11:37				50.4	
3/14/2011	3/14/11 11:40	11:40					
3/14/2011	3/14/11 11:44	11:44				19.6	
3/14/2011	3/14/11 11:50	11:50					
3/14/2011	3/14/11 12:00	12:00					
3/14/2011	3/14/11 12:04	12:04					
3/14/2011	3/14/11 12:06	12:06				10.8	
3/14/2011	3/14/11 12:10	12:10					
3/14/2011	3/14/11 12:16	12:16					
3/14/2011	3/14/11 12:20	12:20					
3/14/2011	3/14/11 12:21	12:21				10.7	
3/14/2011	3/14/11 12:30	12:30					
3/14/2011	3/14/11 12:34	12:34					
3/14/2011	3/14/11 12:40	12:40					
3/14/2011	3/14/11 12:46	12:46					
3/14/2011	3/14/11 12:50	12:50					
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3/14/2011	3/14/11 13:10	13:10				12.0	
3/14/2011	3/14/11 13:12	13:12					
3/14/2011	3/14/11 13:15	13:15				13.0	
3/14/2011	3/14/11 13:20	13:20					
3/14/2011	3/14/11 13:25	13:25				14.0	
3/14/2011	3/14/11 13:28	13:28					
3/14/2011	3/14/11 13:30	13:30				13.0	
3/14/2011	3/14/11 13:35	13:35				13.0	
3/14/2011	3/14/11 13:40	13:40				11.0	

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3/14/2011	3/14/11 13:50	13:50				13.0	
3/14/2011	3/14/11 13:55	13:55				15.0	
3/14/2011	3/14/11 14:00	14:00					
3/14/2011	3/14/11 14:02	14:02					
3/14/2011	3/14/11 14:10	14:10					
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3/14/2011	3/14/11 14:20	14:20					
3/14/2011	3/14/11 14:30	14:30					
3/14/2011	3/14/11 14:40	14:40					
3/14/2011	3/14/11 14:50	14:50					
3/14/2011	3/14/11 15:00	15:00					
3/14/2011	3/14/11 15:10	15:10					
3/14/2011	3/14/11 15:20	15:20					
3/14/2011	3/14/11 15:30	15:30					
3/14/2011	3/14/11 15:40	15:40					
3/14/2011	3/14/11 15:50	15:50					
3/14/2011	3/14/11 16:00	16:00					
3/14/2011	3/14/11 16:10	16:10					
3/14/2011	3/14/11 16:20	16:20					
3/14/2011	3/14/11 16:30	16:30					
3/14/2011	3/14/11 16:40	16:40					
3/14/2011	3/14/11 16:50	16:50					
3/14/2011	3/14/11 17:00	17:00				8.1	
3/14/2011	3/14/11 17:10	17:10				8.1	
3/14/2011	3/14/11 17:20	17:20				7.3	
3/14/2011	3/14/11 17:30	17:30				7.6	
3/14/2011	3/14/11 17:40	17:40				7.6	
3/14/2011	3/14/11 17:50	17:50				8.0	
3/14/2011	3/14/11 18:00	18:00				7.6	
3/14/2011	3/14/11 18:10	18:10				7.0	
3/14/2011	3/14/11 18:20	18:20				7.2	
3/14/2011	3/14/11 18:30	18:30				8.0	
3/14/2011	3/14/11 18:40	18:40				10.4	
3/14/2011	3/14/11 18:46	18:46				10.1	
3/14/2011	3/14/11 18:50	18:50					
3/14/2011	3/14/11 19:00	19:00				7.7	
3/14/2011	3/14/11 19:10	19:10				7.8	
3/14/2011	3/14/11 19:20	19:20				7.7	
3/14/2011	3/14/11 19:30	19:30				8.9	
3/14/2011	3/14/11 19:40	19:40				7.6	
3/14/2011	3/14/11 19:50	19:50				5.5	
3/14/2011	3/14/11 20:00	20:00				5.4	
3/14/2011	3/14/11 20:10	20:10				5.4	
3/14/2011	3/14/11 20:20	20:20				5.4	
3/14/2011	3/14/11 20:30	20:30				5.4	
3/14/2011	3/14/11 20:40	20:40				5.4	

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3/14/2011	3/14/11 20:55	20:55				5.0	
3/14/2011	3/14/11 21:00	21:00				5.8	
3/14/2011	3/14/11 21:05	21:05				5.8	
3/14/2011	3/14/11 21:10	21:10				6.0	
3/14/2011	3/14/11 21:15	21:15				5.8	
3/14/2011	3/14/11 21:20	21:20				6.0	
3/14/2011	3/14/11 21:25	21:25				6.8	
3/14/2011	3/14/11 21:30	21:30				29.7	
3/14/2011	3/14/11 21:35	21:35				760.0	
3/14/2011	3/14/11 21:37	21:37				3130.0	
3/14/2011	3/14/11 21:40	21:40					
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3/14/2011	3/14/11 22:00	22:00					
3/14/2011	3/14/11 22:10	22:10					
3/14/2011	3/14/11 22:15	22:15				431.7	
3/14/2011	3/14/11 22:20	22:20				336.6	
3/14/2011	3/14/11 22:25	22:25				301.9	
3/14/2011	3/14/11 22:30	22:30					
3/14/2011	3/14/11 22:35	22:35				326.2	
3/14/2011	3/14/11 22:40	22:40				293.7	
3/14/2011	3/14/11 22:45	22:45				271.7	
3/14/2011	3/14/11 22:50	22:50				267.0	
3/14/2011	3/14/11 22:55	22:55				263.0	
3/14/2011	3/14/11 23:00	23:00				252.7	
3/14/2011	3/14/11 23:05	23:05				242.8	
3/14/2011	3/14/11 23:10	23:10				235.3	
3/14/2011	3/14/11 23:15	23:15				231.5	
3/14/2011	3/14/11 23:20	23:20				227.0	
3/14/2011	3/14/11 23:25	23:25				216.0	
3/14/2011	3/14/11 23:30	23:30				216.0	
3/14/2011	3/14/11 23:35	23:35				211.3	
3/14/2011	3/14/11 23:40	23:40				205.6	
3/14/2011	3/14/11 23:45	23:45				201.7	
3/14/2011	3/14/11 23:50	23:50				196.2	
3/14/2011	3/14/11 23:55	23:55				192.3	
3/15/2011	3/15/11 0:00	0:00				188.9	
3/15/2011	3/15/11 0:05	0:05				185.0	
3/15/2011	3/15/11 0:10	0:10				181.0	
3/15/2011	3/15/11 0:15	0:15				177.3	
3/15/2011	3/15/11 0:20	0:20				175.8	
3/15/2011	3/15/11 0:25	0:25				177.3	
3/15/2011	3/15/11 0:30	0:30				168.0	
3/15/2011	3/15/11 0:35	0:35				164.9	
3/15/2011	3/15/11 0:40	0:40				164.4	
3/15/2011	3/15/11 0:45	0:45				167.7	
3/15/2011	3/15/11 0:50	0:50				164.3	

3/15/2011	3/15/11 0:55	0:55				151.7	
3/15/2011	3/15/11 1:00	1:00				150.3	
3/15/2011	3/15/11 1:05	1:05				147.1	
3/15/2011	3/15/11 1:10	1:10				144.1	
3/15/2011	3/15/11 1:15	1:15				141.4	
3/15/2011	3/15/11 1:20	1:20				137.8	
3/15/2011	3/15/11 1:30	1:30				135.5	
3/15/2011	3/15/11 1:40	1:40				130.4	
3/15/2011	3/15/11 1:50	1:50				123.3	
3/15/2011	3/15/11 2:00	2:00				120.2	
3/15/2011	3/15/11 2:10	2:10				114.1	
3/15/2011	3/15/11 2:20	2:20				111.4	
3/15/2011	3/15/11 2:30	2:30				109.6	
3/15/2011	3/15/11 2:40	2:40				105.4	
3/15/2011	3/15/11 2:50	2:50					
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3/15/2011	3/15/11 3:10	3:10				94.3	
3/15/2011	3/15/11 3:20	3:20				92.8	
3/15/2011	3/15/11 3:30	3:30					
3/15/2011	3/15/11 3:40	3:40				87.0	
3/15/2011	3/15/11 3:50	3:50					
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3/15/2011	3/15/11 4:10	4:10					
3/15/2011	3/15/11 4:20	4:20				77.6	
3/15/2011	3/15/11 4:30	4:30					
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3/15/2011	3/15/11 4:50	4:50					
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3/15/2011	3/15/11 5:20	5:20				67.4	
3/15/2011	3/15/11 5:30	5:30					
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3/15/2011	3/15/11 5:50	5:50					
3/15/2011	3/15/11 6:00	6:00				73.2	
3/15/2011	3/15/11 6:10	6:10					
3/15/2011	3/15/11 6:20	6:20					
3/15/2011	3/15/11 6:30	6:30					
3/15/2011	3/15/11 6:40	6:40					
3/15/2011	3/15/11 6:50	6:50				583.7	
3/15/2011	3/15/11 6:55	6:55				456.5	
3/15/2011	3/15/11 7:00	7:00				965.5	
3/15/2011	3/15/11 7:02	7:02				882.7	
3/15/2011	3/15/11 7:05	7:05				387.3	
3/15/2011	3/15/11 7:10	7:10				431.8	
3/15/2011	3/15/11 7:15	7:15				360.8	
3/15/2011	3/15/11 7:20	7:20				302.1	
3/15/2011	3/15/11 7:25	7:25				234.7	

3/15/2011	3/15/11 7:30	7:30				250.8	
3/15/2011	3/15/11 7:38	7:38				1390.0	
3/15/2011	3/15/11 7:40	7:40				529.0	
3/15/2011	3/15/11 7:45	7:45				537.4	
3/15/2011	3/15/11 7:50	7:50				1941.0	
3/15/2011	3/15/11 8:00	8:00				873.1	
3/15/2011	3/15/11 8:05	8:05				378.4	
3/15/2011	3/15/11 8:10	8:10				268.9	
3/15/2011	3/15/11 8:15	8:15				735.9	
3/15/2011	3/15/11 8:20	8:20				807.7	
3/15/2011	3/15/11 8:25	8:25				1413.0	
3/15/2011	3/15/11 8:30	8:30					
3/15/2011	3/15/11 8:31	8:31				8217.0	
3/15/2011	3/15/11 8:35	8:35				2406.0	
3/15/2011	3/15/11 8:40	8:40				1726.0	
3/15/2011	3/15/11 8:45	8:45				1811.0	
3/15/2011	3/15/11 8:50	8:50				2208.0	
3/15/2011	3/15/11 8:55	8:55				3509.0	
3/15/2011	3/15/11 9:00	9:00				11930.0	
3/15/2011	3/15/11 9:10	9:10					
3/15/2011	3/15/11 9:20	9:20					
3/15/2011	3/15/11 9:30	9:30					
3/15/2011	3/15/11 9:35	9:35				7241.0	
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3/15/2011	3/15/11 10:50	10:50					
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3/15/2011	3/15/11 11:20	11:20					
3/15/2011	3/15/11 11:30	11:30					
3/15/2011	3/15/11 11:40	11:40			253.8		
3/15/2011	3/15/11 11:45	11:45			162.4		
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3/15/2011	3/15/11 12:05	12:05			2431.0		
3/15/2011	3/15/11 12:10	12:10					
3/15/2011	3/15/11 12:15	12:15			2434.0		
3/15/2011	3/15/11 12:20	12:20					
3/15/2011	3/15/11 12:25	12:25				1407.0	
3/15/2011	3/15/11 12:30	12:30				1362.0	

3/15/2011	3/15/11 12:35	12:35				1325.0	
3/15/2011	3/15/11 12:40	12:40				1300.0	
3/15/2011	3/15/11 12:45	12:45				1267.0	
3/15/2011	3/15/11 12:50	12:50				1242.0	
3/15/2011	3/15/11 12:55	12:55				1216.0	
3/15/2011	3/15/11 13:00	13:00				1191.0	
3/15/2011	3/15/11 13:10	13:10				1148.0	
3/15/2011	3/15/11 13:20	13:20				1100.0	
3/15/2011	3/15/11 13:30	13:30				1068.0	
3/15/2011	3/15/11 13:40	13:40				1014.0	
3/15/2011	3/15/11 13:50	13:50				969.9	
3/15/2011	3/15/11 14:00	14:00				928.2	
3/15/2011	3/15/11 14:10	14:10				903.9	
3/15/2011	3/15/11 14:20	14:20				874.4	
3/15/2011	3/15/11 14:30	14:30				855.5	
3/15/2011	3/15/11 14:40	14:40				821.3	
3/15/2011	3/15/11 14:50	14:50				673.8	
3/15/2011	3/15/11 15:00	15:00				649.0	
3/15/2011	3/15/11 15:10	15:10				328.5	
3/15/2011	3/15/11 15:20	15:20				613.8	
3/15/2011	3/15/11 15:30	15:30				596.4	
3/15/2011	3/15/11 15:40	15:40				566.9	
3/15/2011	3/15/11 15:50	15:50				544.9	
3/15/2011	3/15/11 16:00	16:00				531.6	
3/15/2011	3/15/11 16:10	16:10				513.2	
3/15/2011	3/15/11 16:20	16:20				502.6	
3/15/2011	3/15/11 16:30	16:30				489.8	
3/15/2011	3/15/11 16:40	16:40				473.0	
3/15/2011	3/15/11 16:50	16:50				460.0	
3/15/2011	3/15/11 17:00	17:00				449.4	
3/15/2011	3/15/11 17:10	17:10				437.5	
3/15/2011	3/15/11 17:20	17:20					
3/15/2011	3/15/11 17:30	17:30				423.5	
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3/15/2011	3/15/11 17:50	17:50					
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3/15/2011	3/15/11 18:10	18:10					
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3/15/2011	3/15/11 19:00	19:00				353.8	
3/15/2011	3/15/11 19:10	19:10					
3/15/2011	3/15/11 19:20	19:20					
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3/15/2011	3/15/11 20:30	20:30				311.3	
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3/15/2011	3/15/11 20:50	20:50					
3/15/2011	3/15/11 21:00	21:00				298.8	
3/15/2011	3/15/11 21:10	21:10					
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3/15/2011	3/15/11 21:30	21:30				282.6	
3/15/2011	3/15/11 21:40	21:40					
3/15/2011	3/15/11 21:50	21:50					
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3/15/2011	3/15/11 22:30	22:30				431.8	
3/15/2011	3/15/11 22:40	22:40					
3/15/2011	3/15/11 22:50	22:50					
3/15/2011	3/15/11 23:00	23:00				4548.0	
3/15/2011	3/15/11 23:10	23:10				6960.0	
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3/15/2011	3/15/11 23:20	23:20				3648.0	
3/15/2011	3/15/11 23:25	23:25				4976.0	
3/15/2011	3/15/11 23:30	23:30				8080.0	
3/15/2011	3/15/11 23:35	23:35				6308.0	
3/15/2011	3/15/11 23:40	23:40				6592.0	
3/15/2011	3/15/11 23:45	23:45				6847.0	
3/15/2011	3/15/11 23:50	23:50				6066.0	
3/15/2011	3/15/11 23:55	23:55				7966.0	
3/16/2011	3/16/11 0:00	0:00				4351.0	
3/16/2011	3/16/11 0:10	0:10				3504.0	
3/16/2011	3/16/11 0:20	0:20				3108.0	
3/16/2011	3/16/11 0:30	0:30				2609.0	
3/16/2011	3/16/11 0:40	0:40				2432.0	
3/16/2011	3/16/11 0:50	0:50				2257.0	
3/16/2011	3/16/11 1:00	1:00				2159.0	
3/16/2011	3/16/11 1:10	1:10				2021.0	
3/16/2011	3/16/11 1:20	1:20				1937.0	
3/16/2011	3/16/11 1:30	1:30				1805.0	
3/16/2011	3/16/11 1:40	1:40				1708.0	
3/16/2011	3/16/11 1:50	1:50				1628.0	
3/16/2011	3/16/11 2:00	2:00				1552.0	
3/16/2011	3/16/11 2:10	2:10				1522.0	
3/16/2011	3/16/11 2:20	2:20				1453.0	
3/16/2011	3/16/11 2:30	2:30				1386.0	
3/16/2011	3/16/11 2:40	2:40				1357.0	
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3/16/2011	3/16/11 4:30	4:30				975.3	
3/16/2011	3/16/11 4:40	4:40					
3/16/2011	3/16/11 4:50	4:50					
3/16/2011	3/16/11 5:00	5:00				918.2	
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3/16/2011	3/16/11 5:50	5:50					
3/16/2011	3/16/11 6:00	6:00				884.0	
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3/16/2011	3/16/11 6:30	6:30				848.0	
3/16/2011	3/16/11 6:40	6:40				837.0	
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3/16/2011	3/16/11 7:00	7:00				808.8	
3/16/2011	3/16/11 7:10	7:10				670.3	
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3/16/2011	3/16/11 7:30	7:30				651.1	
3/16/2011	3/16/11 7:40	7:40				644.0	
3/16/2011	3/16/11 7:50	7:50				636.8	
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3/16/2011	3/16/11 8:30	8:30				606.6	
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3/16/2011	3/16/11 8:50	8:50				593.4	
3/16/2011	3/16/11 9:00	9:00				587.6	
3/16/2011	3/16/11 9:10	9:10				582.2	
3/16/2011	3/16/11 9:20	9:20				582.4	
3/16/2011	3/16/11 9:30	9:30				582.3	
3/16/2011	3/16/11 9:40	9:40				641.8	
3/16/2011	3/16/11 9:50	9:50				700.6	
3/16/2011	3/16/11 10:00	10:00				810.3	
3/16/2011	3/16/11 10:10	10:10				908.5	
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3/16/2011	3/16/11 10:30	10:30				1361.0	
3/16/2011	3/16/11 10:40	10:40					

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3/16/2011	3/16/11 10:54	10:54				2300.0	
3/16/2011	3/16/11 10:55	10:55				2900.0	
3/16/2011	3/16/11 11:00	11:00				3391.0	
3/16/2011	3/16/11 11:10	11:10				2720.0	
3/16/2011	3/16/11 11:20	11:20				1900.0	
3/16/2011	3/16/11 11:30	11:30				5350.0	
3/16/2011	3/16/11 11:40	11:40				2633.0	
3/16/2011	3/16/11 11:50	11:50				2578.0	
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3/16/2011	3/16/11 12:20	12:20				3261.0	
3/16/2011	3/16/11 12:30	12:30				10850.0	
3/16/2011	3/16/11 12:40	12:40				8234.0	
3/16/2011	3/16/11 12:50	12:50				2851.0	
3/16/2011	3/16/11 13:00	13:00				2672.0	
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3/16/2011	3/16/11 13:30	13:30				2331.0	
3/16/2011	3/16/11 13:40	13:40				2257.0	
3/16/2011	3/16/11 13:50	13:50				2182.0	
3/16/2011	3/16/11 14:00	14:00				2122.0	
3/16/2011	3/16/11 14:10	14:10				2059.0	
3/16/2011	3/16/11 14:20	14:20				2022.0	
3/16/2011	3/16/11 14:30	14:30				1937.0	
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3/16/2011	3/16/11 14:50	14:50				1835.0	
3/16/2011	3/16/11 15:00	15:00				1788.0	
3/16/2011	3/16/11 15:10	15:10				1752.0	
3/16/2011	3/16/11 15:20	15:20				1697.0	
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3/16/2011	3/16/11 15:40	15:40				1629.0	
3/16/2011	3/16/11 15:50	15:50				1591.0	
3/16/2011	3/16/11 16:00	16:00				1556.0	
3/16/2011	3/16/11 16:10	16:10				1530.0	
3/16/2011	3/16/11 16:20	16:20				1472.0	
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3/16/2011	3/16/11 16:40	16:40					
3/16/2011	3/16/11 16:50	16:50					
3/16/2011	3/16/11 17:00	17:00					
3/16/2011	3/16/11 17:03	17:03		752.0			
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3/16/2011	3/16/11 17:40	17:40		738.2			
3/16/2011	3/16/11 17:50	17:50		735.0			

3/16/2011	3/16/11 18:00	18:00		731.0			
3/16/2011	3/16/11 18:10	18:10		728.0			
3/16/2011	3/16/11 18:20	18:20		725.9			
3/16/2011	3/16/11 18:30	18:30		723.3			
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3/16/2011	3/16/11 19:00	19:00			385.4		
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3/16/2011	3/16/11 19:30	19:30			380.7		
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3/16/2011	3/16/11 19:50	19:50					
3/16/2011	3/16/11 20:00	20:00			375.5		
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3/16/2011	3/16/11 20:30	20:30			373.6		
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3/16/2011	3/16/11 20:50	20:50					
3/16/2011	3/16/11 21:00	21:00			370.2		
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3/16/2011	3/16/11 21:20	21:20					
3/16/2011	3/16/11 21:30	21:30			366.5		
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3/16/2011	3/16/11 21:50	21:50					
3/16/2011	3/16/11 22:00	22:00			363.7		
3/16/2011	3/16/11 22:10	22:10					
3/16/2011	3/16/11 22:20	22:20					
3/16/2011	3/16/11 22:30	22:30			361.2		
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3/16/2011	3/16/11 22:50	22:50					
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3/16/2011	3/16/11 23:10	23:10					
3/16/2011	3/16/11 23:20	23:20					
3/16/2011	3/16/11 23:30	23:30			355.7		
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3/16/2011	3/16/11 23:50	23:50					
3/17/2011	3/17/11 0:00	0:00					
3/17/2011	3/17/11 0:10	0:10					
3/17/2011	3/17/11 0:20	0:20					
3/17/2011	3/17/11 0:30	0:30			351.4		
3/17/2011	3/17/11 0:40	0:40					
3/17/2011	3/17/11 0:50	0:50			350.1		
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3/17/2011	3/17/11 1:20	1:20					
3/17/2011	3/17/11 1:30	1:30			348.2		
3/17/2011	3/17/11 1:40	1:40					

3/17/2011	3/17/11 1:50	1:50					
3/17/2011	3/17/11 2:00	2:00			345.9		
3/17/2011	3/17/11 2:10	2:10					
3/17/2011	3/17/11 2:20	2:20					
3/17/2011	3/17/11 2:30	2:30			344.8		
3/17/2011	3/17/11 2:40	2:40					
3/17/2011	3/17/11 2:50	2:50					
3/17/2011	3/17/11 3:00	3:00			344.6		
3/17/2011	3/17/11 3:10	3:10					
3/17/2011	3/17/11 3:20	3:20					
3/17/2011	3/17/11 3:30	3:30			341.7		
3/17/2011	3/17/11 3:40	3:40					
3/17/2011	3/17/11 3:50	3:50					
3/17/2011	3/17/11 4:00	4:00			340.8		
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3/17/2011	3/17/11 4:20	4:20					
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3/17/2011	3/17/11 4:50	4:50					
3/17/2011	3/17/11 5:00	5:00			338.3		
3/17/2011	3/17/11 5:10	5:10					
3/17/2011	3/17/11 5:20	5:20					
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3/17/2011	3/17/11 5:50	5:50					
3/17/2011	3/17/11 6:00	6:00			334.7		
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3/17/2011	3/17/11 6:20	6:20					
3/17/2011	3/17/11 6:30	6:30			333.8		
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3/17/2011	3/17/11 6:50	6:50					
3/17/2011	3/17/11 7:00	7:00			314.5		
3/17/2011	3/17/11 7:10	7:10					
3/17/2011	3/17/11 7:20	7:20					
3/17/2011	3/17/11 7:30	7:30			313.5		
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3/17/2011	3/17/11 7:50	7:50		381.3			
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3/17/2011	3/17/11 8:20	8:20					
3/17/2011	3/17/11 8:30	8:30		373.0			
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3/17/2011	3/17/11 8:50	8:50		372.7			
3/17/2011	3/17/11 9:00	9:00		373.7			
3/17/2011	3/17/11 9:10	9:10		371.9			
3/17/2011	3/17/11 9:20	9:20					
3/17/2011	3/17/11 9:30	9:30	3786.0				

3/17/2011	3/17/11 9:40	9:40	3782.0				
3/17/2011	3/17/11 9:50	9:50	3763.0				
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3/17/2011	3/17/11 10:20	10:20	3754.0				
3/17/2011	3/17/11 10:30	10:30	3750.0				
3/17/2011	3/17/11 10:40	10:40	3753.0				
3/17/2011	3/17/11 10:50	10:50	3743.0				
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3/17/2011	3/17/11 11:30	11:30			312.3		
3/17/2011	3/17/11 11:40	11:40					
3/17/2011	3/17/11 11:50	11:50					
3/17/2011	3/17/11 12:00	12:00			311.0		
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3/17/2011	3/17/11 12:20	12:20					
3/17/2011	3/17/11 12:30	12:30			310.7		
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3/17/2011	3/17/11 12:50	12:50					
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3/17/2011	3/17/11 13:20	13:20			309.1		
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3/17/2011	3/17/11 14:20	14:20					
3/17/2011	3/17/11 14:30	14:30			310.3		
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3/17/2011	3/17/11 14:50	14:50					
3/17/2011	3/17/11 15:00	15:00			309.1		
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3/17/2011	3/17/11 15:20	15:20					
3/17/2011	3/17/11 15:30	15:30			309.7		
3/17/2011	3/17/11 15:40	15:40					
3/17/2011	3/17/11 15:50	15:50	3700.0				
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3/17/2011	3/17/11 16:00	16:00	3698.0				
3/17/2011	3/17/11 16:05	16:05	3695.0				
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3/17/2011	3/17/11 19:10	19:10	3626.0				
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3/17/2011	3/17/11 20:30	20:30					
3/17/2011	3/17/11 20:40	20:40			292.2		
3/17/2011	3/17/11 20:50	20:50					
3/17/2011	3/17/11 21:00	21:00			291.9		
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3/17/2011	3/17/11 21:40	21:40			291.1		
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3/17/2011	3/17/11 22:20	22:20			289.9		
3/17/2011	3/17/11 22:30	22:30			289.7		
3/17/2011	3/17/11 22:40	22:40			289.6		
3/17/2011	3/17/11 22:50	22:50			289.5		

3/17/2011	3/17/11 23:00	23:00			289.0		
3/17/2011	3/17/11 23:10	23:10			289.0		
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3/17/2011	3/17/11 23:30	23:30			288.7		
3/17/2011	3/17/11 23:40	23:40			287.8		
3/17/2011	3/17/11 23:50	23:50			288.9		
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3/18/2011	3/18/11 0:10	0:10			287.3		
3/18/2011	3/18/11 0:20	0:20			286.6		
3/18/2011	3/18/11 0:30	0:30			286.4		
3/18/2011	3/18/11 0:40	0:40			286.3		
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3/18/2011	3/18/11 1:10	1:10			285.5		
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3/18/2011	3/18/11 1:50	1:50			284.4		
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3/18/2011	3/18/11 2:30	2:30			283.5		
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3/18/2011	3/18/11 5:00	5:00			279.4		
3/18/2011	3/18/11 5:10	5:10			279.3		
3/18/2011	3/18/11 5:20	5:20			279.0		
3/18/2011	3/18/11 5:30	5:30			278.9		
3/18/2011	3/18/11 5:40	5:40			278.9		
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3/18/2011	3/18/11 6:00	6:00			274.0		
3/18/2011	3/18/11 6:10	6:10			274.0		
3/18/2011	3/18/11 6:20	6:20			273.8		
3/18/2011	3/18/11 6:30	6:30			274.1		
3/18/2011	3/18/11 6:40	6:40			272.7		

3/18/2011	3/18/11 6:50	6:50			273.4		
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3/18/2011	3/18/11 7:20	7:20			271.6		
3/18/2011	3/18/11 7:30	7:30			271.4		
3/18/2011	3/18/11 7:40	7:40			271.1		
3/18/2011	3/18/11 7:50	7:50			271.2		
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3/18/2011	3/18/11 8:20	8:20			269.9		
3/18/2011	3/18/11 8:30	8:30			269.9		
3/18/2011	3/18/11 8:40	8:40			269.8		
3/18/2011	3/18/11 8:50	8:50			269.2		
3/18/2011	3/18/11 9:00	9:00			268.7		
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3/18/2011	3/18/11 9:20	9:20			268.9		
3/18/2011	3/18/11 9:30	9:30			267.5		
3/18/2011	3/18/11 9:40	9:40			267.0		
3/18/2011	3/18/11 9:50	9:50			266.9		
3/18/2011	3/18/11 10:00	10:00			266.7		
3/18/2011	3/18/11 10:10	10:10			266.4		
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3/18/2011	3/18/11 10:30	10:30			265.7		
3/18/2011	3/18/11 10:40	10:40			265.4		
3/18/2011	3/18/11 10:50	10:50			264.8		
3/18/2011	3/18/11 11:00	11:00			265.0		
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3/18/2011	3/18/11 11:20	11:20			264.5		
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3/18/2011	3/18/11 11:50	11:50			263.4		
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3/18/2011	3/18/11 12:20	12:20			262.9		
3/18/2011	3/18/11 12:30	12:30			263.3		
3/18/2011	3/18/11 12:40	12:40			264.3		
3/18/2011	3/18/11 12:50	12:50			261.3		
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3/18/2011	3/18/11 14:20	14:20	3362.0				

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3/18/2011	3/18/11 14:30	14:30	3352.0				
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3/18/2011	3/18/11 14:55	14:55	3346.0				
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3/18/2011	3/18/11 15:20	15:20	3582.0				
3/18/2011	3/18/11 15:30	15:30	4075.0				
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3/18/2011	3/18/11 15:50	15:50	4396.0				
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3/18/2011	3/18/11 16:10	16:10	4352.0				
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3/18/2011	3/18/11 17:50	17:50	4090.0				
3/18/2011	3/18/11 18:00	18:00	4084.0				
3/18/2011	3/18/11 18:10	18:10	4069.0				
3/18/2011	3/18/11 18:20	18:20	4069.0				
3/18/2011	3/18/11 18:30	18:30	3922.0				
3/18/2011	3/18/11 18:40	18:40	3885.0				
3/18/2011	3/18/11 18:50	18:50	3832.0				
3/18/2011	3/18/11 19:00	19:00	3788.0				
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3/18/2011	3/18/11 19:30	19:30	3699.0				
3/18/2011	3/18/11 19:40	19:40	3669.0				
3/18/2011	3/18/11 19:50	19:50	3634.0				
3/18/2011	3/18/11 20:00	20:00	3611.0				
3/18/2011	3/18/11 20:10	20:10			447.6		
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3/18/2011	3/18/11 20:30	20:30			434.5		
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3/18/2011	3/18/11 20:50	20:50			423.9		
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3/18/2011	3/18/11 21:10	21:10			414.2		
3/18/2011	3/18/11 21:20	21:20			409.4		
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3/18/2011	3/18/11 22:20	22:20			385.9		
3/18/2011	3/18/11 22:30	22:30			382.9		
3/18/2011	3/18/11 22:40	22:40			379.6		
3/18/2011	3/18/11 22:50	22:50			375.9		
3/18/2011	3/18/11 23:00	23:00			373.6		
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3/18/2011	3/18/11 23:20	23:20			368.9		
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3/18/2011	3/18/11 23:40	23:40	3256.0				
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3/19/2011	3/19/11 0:10	0:10	3224.0				
3/19/2011	3/19/11 0:20	0:20	3219.0				
3/19/2011	3/19/11 0:30	0:30	3231.0				
3/19/2011	3/19/11 0:40	0:40	3342.0				
3/19/2011	3/19/11 0:50	0:50	3284.0				
3/19/2011	3/19/11 1:00	1:00	3248.0				
3/19/2011	3/19/11 1:10	1:10	3279.0				
3/19/2011	3/19/11 1:20	1:20	3247.0				
3/19/2011	3/19/11 1:30	1:30	3195.0				
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3/19/2011	3/19/11 1:50	1:50	3181.0				
3/19/2011	3/19/11 2:00	2:00			313.7		
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3/19/2011	3/19/11 2:20	2:20			311.1		
3/19/2011	3/19/11 2:30	2:30			310.0		
3/19/2011	3/19/11 2:40	2:40			309.1		
3/19/2011	3/19/11 2:50	2:50			308.6		
3/19/2011	3/19/11 3:00	3:00			306.9		
3/19/2011	3/19/11 3:10	3:10			306.0		
3/19/2011	3/19/11 3:20	3:20			305.1		
3/19/2011	3/19/11 3:30	3:30			304.3		
3/19/2011	3/19/11 3:40	3:40			303.6		
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3/19/2011	3/19/11 4:30	4:30			299.2		
3/19/2011	3/19/11 4:40	4:40			299.2		
3/19/2011	3/19/11 4:50	4:50			298.6		
3/19/2011	3/19/11 5:00	5:00			297.5		
3/19/2011	3/19/11 5:10	5:10			296.4		
3/19/2011	3/19/11 5:20	5:20			295.8		

3/19/2011	3/19/11 5:30	5:30			295.1		
3/19/2011	3/19/11 5:40	5:40			295.4		
3/19/2011	3/19/11 5:50	5:50			294.3		
3/19/2011	3/19/11 6:00	6:00			293.8		
3/19/2011	3/19/11 6:10	6:10			293.6		
3/19/2011	3/19/11 6:20	6:20			292.6		
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3/19/2011	3/19/11 11:30	11:30			313.1		
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3/19/2011	3/19/11 12:40	12:40	3704.0				
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3/19/2011	3/19/11 13:10	13:10	3594.0				

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3/19/2011	3/19/11 13:50	13:50	3473.0				
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3/19/2011	3/19/11 14:20	14:20	3396.0				
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3/19/2011	3/19/11 17:30	17:30	3051.0				
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3/20/2011	3/20/11 2:40	2:40	2764.0				
3/20/2011	3/20/11 2:50	2:50	2761.0				
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3/20/2011	3/20/11 3:20	3:20	2745.0				
3/20/2011	3/20/11 3:30	3:30	2741.0				
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3/20/2011	3/20/11 6:40	6:40	2654.0				
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3/20/2011	3/20/11 7:10	7:10	2661.0				
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3/20/2011	3/20/11 7:50	7:50	2637.0				
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3/20/2011	3/20/11 8:50	8:50	2617.0				
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3/20/2011	3/20/11 10:50	10:50	2583.0				
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3/20/2011	3/20/11 12:20	12:20	2552.0				
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3/20/2011	3/20/11 12:40	12:40	2551.0				

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3/21/2011	3/21/11 1:50	1:50	2398.0				
3/21/2011	3/21/11 2:00	2:00	2396.0				
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3/21/2011	3/21/11 2:40	2:40	2383.0				
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3/21/2011	3/21/11 3:00	3:00	2378.0				
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3/28/2011	3/28/11 0:10	0:10			127.9		
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3/28/2011	3/28/11 1:40	1:40			127.3		
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3/28/2011	3/28/11 2:40	2:40			126.8		
3/28/2011	3/28/11 2:50	2:50			126.8		
3/28/2011	3/28/11 3:00	3:00			126.7		
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3/28/2011	3/28/11 4:00	4:00			126.2		
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3/28/2011	3/28/11 6:00	6:00			125.8		
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3/28/2011	3/28/11 6:40	6:40			125.2		
3/28/2011	3/28/11 6:50	6:50			125.3		
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3/28/2011	3/28/11 9:40	9:40			130.3		
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3/29/2011	3/29/11 0:40	0:40			117.5		
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3/29/2011	3/29/11 1:00	1:00			117.5		
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10:00			109.3									
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23:00			101.3								
23:10			101.6								
23:20			101.1								
23:30			100.9								
23:40			100.7								
23:50			100.8								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
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0:30			117.5									
0:40			117.5									
0:50			117.5									
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2:50			116.8									
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3:10			116.5									
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4:00			116.2									
4:10			116.2									
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4:40			175.5									
4:50			173.0									
5:00			182.0									
5:10			155.0									
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5:40			126.6									
5:50			128.5									
6:00			127.6									
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6:20			120.1									
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8:10			134.7									
8:20			128.2									
8:30			130.3									
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9:20			130.3									
9:30			129.6									
9:40			127.8									
9:50			127.0									

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16:00			117.5									
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16:50			119.9									
17:00			121.5									
17:10			119.9									
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19:30			115.4									
19:40			115.3									
19:50			115.1									
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20:30			114.4									
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22:50			112.5									
23:00			112.4									
23:10			112.6									
23:20			112.4									
23:30			112.2									
23:40			112.5									
23:50			113.2									

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
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0:10			127.9									
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2:40			126.8									
2:50			126.8									
3:00			126.7									
3:10			126.4									
3:20			126.5									
3:30			126.4									
3:40			126.1									
3:50			126.3									
4:00			126.2									
4:10			125.9									
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5:30			125.0									
5:40			125.4									
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6:00			125.8									
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6:20			125.4									
6:30			125.1									
6:40			125.2									
6:50			125.3									
7:00			125.1									
7:10			125.3									
7:20			125.1									
7:30			125.0									
7:40			125.1									
7:50			125.0									
8:00			124.9									
8:10			125.0									
8:20			124.9									
8:30			124.8									
8:40			128.0									
8:50			152.7									
9:00			140.4									
9:10			132.9									
9:20			130.2									
9:30			135.5									
9:40			130.3									
9:50			128.0									

10:00			128.1									
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10:20			127.1									
10:30			127.1									
10:40			126.7									
10:50			126.4									
11:00			126.1									
11:10			126.0									
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11:30			125.6									
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11:50			125.5									
12:00			125.4									
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12:30			125.1									
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13:00			124.7									
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22:50			118.0									
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23:50			117.7									

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
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0:10			140.3									
0:20			140.2									
0:30			140.1									
0:40			140.3									
0:50			140.3									
1:00			140.3									
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2:30			139.7									
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2:50			139.6									
3:00			139.4									
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3:20			138.3									
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4:40			137.4									
4:50			137.3									
5:00			137.1									
5:10			137.2									
5:20			136.9									
5:30			137.0									
5:40			136.7									
5:50			136.7									
6:00			136.6									
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6:20			136.6									
6:30			136.2									
6:40			136.4									
6:50			136.2									
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7:20			136.1									
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7:40			136.0									
7:50			135.8									
8:00			135.8									
8:10			135.8									
8:20			135.7									
8:30			135.6									
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9:00			135.5									
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12:00			134.6									
12:10			134.6									
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12:30			134.3									
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23:00			128.4								
23:10			128.3								
23:20			128.1								
23:30			128.0								
23:40			128.0								
23:50			128.0								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
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0:20				183.8								
0:30				183.2								
0:40				182.8								
0:50				182.7								
1:00				182.5								
1:10				182.4								
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1:50				180.8								
2:00				179.9								
2:10				178.1								
2:20				176.6								
2:30				175.5								
2:40				174.4								
2:50				173.0								
3:00				172.4								
3:10				171.0								
3:20				170.7								
3:30				169.8								
3:40				169.2								
3:50				169.5								
4:00				169.2								
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4:50				167.1								
5:00				166.9								
5:10				167.1								
5:20				167.4								
5:30				167.6								
5:40				167.8								
5:50				168.0								
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6:10				168.0								
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6:30				169.2								
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6:50				169.7								
7:00				169.5								
7:10				169.0								
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7:30				170.0								
7:40				169.9								
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9:00				170.8								
9:10				170.7								
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9:30				170.6								
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22:00			141.8									
22:10			141.5									
22:20			141.3									
22:30			141.2									
22:40			141.1									
22:50			141.1									
23:00			140.9									
23:10			140.8									
23:20			140.8									
23:30			140.8									
23:40			140.7									
23:50			140.4									

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00				199.5								
0:10				199.3								
0:20				199.0								
0:30				199.0								
0:40				198.9								
0:50				198.8								
1:00				198.6								
1:10				197.7								
1:20				197.0								
1:30				196.9								
1:40				196.5								
1:50				196.5								
2:00				196.5								
2:10				196.4								
2:20				196.3								
2:30				196.1								
2:40				195.9								
2:50				195.8								
3:00				195.7								
3:10				195.7								
3:20				195.6								
3:30				195.6								
3:40				195.5								
3:50				195.1								
4:00				195.1								
4:10				195.0								
4:20				195.0								
4:30				195.0								
4:40				194.5								
4:50				194.5								
5:00				194.4								
5:10				194.4								
5:20				194.3								
5:30				194.2								
5:40				194.1								
5:50				193.8								
6:00				193.8								
6:10				193.6								
6:20				193.0								
6:30				192.9								
6:40				193.0								
6:50				192.5								
7:00				192.6								
7:10				192.5								
7:20				192.7								
7:30				192.3								
7:40				192.5								
7:50				193.3								
8:00				193.8								
8:10				193.9								
8:20				193.3								
8:30				196.3								
8:40				196.3								
8:50				192.8								
9:00				192.6								
9:10				192.3								
9:20				192.5								
9:30				193.7								
9:40				191.7								
9:50				204.2								

10:00				216.2								
10:10				203.2								
10:20				430.8								
10:30				540.0								
10:40				286.5								
10:50				264.7								
11:00				259.0								
11:10				255.2								
11:20				250.9								
11:30				248.6								
11:40				244.3								
11:50				240.0								
12:00				235.8								
12:10				232.8								
12:20				231.6								
12:30				229.5								
12:40				226.7								
12:50				224.5								
13:00				222.3								
13:10				221.2								
13:20				218.8								
13:30				216.4								
13:40				216.2								
13:50				213.7								
14:00				212.6								
14:10				210.8								
14:20				209.0								
14:30				209.0								
14:40				207.2								
14:50				206.6								
15:00				205.8								
15:10				204.8								
15:20				203.6								
15:30				202.5								
15:40				201.7								
15:50				199.5								
16:00				197.4								
16:10				196.9								
16:20				197.6								
16:30				196.1								
16:40				197.2								
16:50				196.8								
17:00				196.0								
17:10				195.9								
17:20				194.9								
17:30				195.4								
17:40				194.5								
17:50				195.6								
18:00				194.7								
18:10				194.4								
18:20				193.6								
18:30				199.5								
18:40				194.4								
18:50				193.6								
19:00				199.5								
19:10				261.7								
19:20				221.9								
19:30				225.0								
19:40				215.4								
19:50				243.0								
20:00				213.9								

20:10				206.3								
20:20				205.2								
20:30				228.4								
20:40				205.9								
20:50				239.6								
21:00				204.9								
21:10				199.5								
21:20				195.4								
21:30				194.4								
21:40				193.0								
21:50				192.3								
22:00				191.4								
22:10				190.4								
22:20				190.1								
22:30				189.6								
22:40				189.2								
22:50				187.6								
23:00				187.0								
23:10				186.4								
23:20				186.0								
23:30				185.3								
23:40				184.8								
23:50				184.7								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00				222.3								
0:10				222.0								
0:20				221.8								
0:30				221.5								
0:40				221.7								
0:50				221.0								
1:00				220.6								
1:10				220.4								
1:20				220.0								
1:30				219.7								
1:40				219.2								
1:50				218.9								
2:00				218.7								
2:10				218.7								
2:20				217.5								
2:30				217.2								
2:40				216.8								
2:50				216.6								
3:00				216.6								
3:10				216.5								
3:20				216.2								
3:30				215.5								
3:40				215.7								
3:50				215.4								
4:00				215.1								
4:10				215.0								
4:20				214.7								
4:30				214.5								
4:40				214.7								
4:50				214.3								
5:00				214.4								
5:10				214.0								
5:20				213.6								
5:30				213.8								
5:40				216.2								
5:50				213.6								
6:00				212.8								
6:10				212.8								
6:20				214.7								
6:30				230.9								
6:40				213.7								
6:50				212.3								
7:00				212.2								
7:10				212.0								
7:20				211.8								
7:30				211.9								
7:40				211.9								
7:50				211.7								
8:00				211.6								
8:10				211.6								
8:20				211.6								
8:30				211.2								
8:40				211.5								
8:50				211.1								
9:00				210.1								
9:10				210.8								
9:20				210.8								
9:30				210.7								
9:40				210.6								
9:50				210.5								

10:00				210.1								
10:10				210.0								
10:20				209.7								
10:30				209.7								
10:40				209.5								
10:50				209.6								
11:00				209.3								
11:10				209.2								
11:20				209.5								
11:30				209.5								
11:40				209.6								
11:50				209.1								
12:00				209.4								
12:10				209.4								
12:20				209.2								
12:30				201.1								
12:40				208.8								
12:50				208.7								
13:00				208.1								
13:10				207.9								
13:20				207.5								
13:30				207.5								
13:40				207.2								
13:50				209.3								
14:00				207.2								
14:10				208.5								
14:20												
14:30												
14:40												
14:50				210.0								
15:00				209.8								
15:10				209.4								
15:20				209.2								
15:30				208.8								
15:40				208.0								
15:50				207.6								
16:00				207.4								
16:10				207.3								
16:20				207.1								
16:30				207.0								
16:40				206.9								
16:50				206.5								
17:00				206.4								
17:10				206.3								
17:20				206.1								
17:30				206.0								
17:40				205.6								
17:50				205.3								
18:00				204.6								
18:10				204.9								
18:20				204.7								
18:30				204.5								
18:40				204.4								
18:50				204.4								
19:00				204.3								
19:10				204.2								
19:20				203.9								
19:30				203.5								
19:40				203.0								
19:50				202.9								
20:00				202.9								

20:10				202.6								
20:20				202.5								
20:30				202.4								
20:40				202.4								
20:50				202.2								
21:00				202.0								
21:10				202.0								
21:20				201.7								
21:30				201.4								
21:40				201.3								
21:50				201.3								
22:00				201.2								
22:10				201.1								
22:20				201.2								
22:30				200.5								
22:40				200.6								
22:50				200.4								
23:00				200.2								
23:10				199.9								
23:20				200.0								
23:30				199.8								
23:40				199.8								
23:50				199.6								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00				233.4								
0:10				233.3								
0:20				232.3								
0:30				231.6								
0:40				230.1								
0:50				229.4								
1:00				227.5								
1:10				227.4								
1:20				227.2								
1:30				226.8								
1:40				226.8								
1:50				226.7								
2:00				226.7								
2:10				226.9								
2:20				227.1								
2:30				227.1								
2:40				227.2								
2:50				227.3								
3:00				227.6								
3:10				228.5								
3:20				228.7								
3:30				228.8								
3:40				228.8								
3:50				229.0								
4:00				229.1								
4:10				229.1								
4:20				229.4								
4:30				229.3								
4:40				229.5								
4:50				229.5								
5:00				229.5								
5:10				229.3								
5:20				229.6								
5:30				229.5								
5:40				229.5								
5:50				229.7								
6:00				229.6								
6:10				229.6								
6:20				229.4								
6:30				229.6								
6:40				229.5								
6:50				229.5								
7:00				229.3								
7:10				229.5								
7:20				229.3								
7:30				229.5								
7:40				229.0								
7:50				229.3								
8:00				229.4								
8:10				229.5								
8:20				229.2								
8:30				229.4								
8:40				229.1								
8:50				229.1								
9:00				229.1								
9:10				228.7								
9:20				227.6								
9:30				226.9								
9:40				228.6								
9:50				227.6								

10:00				211.4								
10:10				227.7								
10:20				227.2								
10:30				227.3								
10:40				227.1								
10:50				227.2								
11:00				227.0								
11:10				226.8								
11:20				226.8								
11:30				226.3								
11:40				225.7								
11:50				226.3								
12:00				225.2								
12:10				226.0								
12:20				224.8								
12:30				224.9								
12:40				224.7								
12:50				224.8								
13:00				225.4								
13:10				224.8								
13:20				225.7								
13:30				224.1								
13:40				223.7								
13:50				222.7								
14:00				222.4								
14:10				231.1								
14:20				435.0								
14:30				288.7								
14:40				309.7								
14:50				267.8								
15:00				265.4								
15:10				396.0								
15:20				415.6								
15:30				414.7								
15:40				401.6								
15:50				318.4								
16:00				331.5								
16:10				313.4								
16:20				280.9								
16:30				283.7								
16:40				274.4								
16:50				269.3								
17:00				265.1								
17:10				262.1								
17:20				259.5								
17:30				257.0								
17:40				255.8								
17:50				254.2								
18:00				256.0								
18:10				251.3								
18:20				241.2								
18:30				249.0								
18:40				246.9								
18:50				245.8								
19:00				244.6								
19:10				243.5								
19:20				242.1								
19:30				241.0								
19:40				240.2								
19:50				237.6								
20:00				236.5								

20:10				235.8								
20:20				235.3								
20:30				234.3								
20:40				233.2								
20:50				232.8								
21:00				232.3								
21:10				231.5								
21:20				230.6								
21:30				230.2								
21:40				229.5								
21:50				228.8								
22:00				228.3								
22:10				227.3								
22:20				226.8								
22:30				226.5								
22:40				225.8								
22:50				225.4								
23:00				224.9								
23:10				224.7								
23:20				224.3								
23:30				224.0								
23:40				223.0								
23:50				223.0								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00				331.8								
0:10				329.3								
0:20				327.5								
0:30				325.8								
0:40				323.9								
0:50				320.8								
1:00				314.8								
1:10				313.0								
1:20				311.3								
1:30				308.9								
1:40				308.4								
1:50				305.9								
2:00				304.5								
2:10				303.2								
2:20				301.3								
2:30				299.7								
2:40				298.0								
2:50				296.2								
3:00				294.9								
3:10				293.8								
3:20				293.6								
3:30				291.6								
3:40				291.1								
3:50				290.0								
4:00				288.9								
4:10				288.1								
4:20				287.0								
4:30				286.0								
4:40				283.6								
4:50				280.1								
5:00				273.9								
5:10				271.0								
5:20				268.0								
5:30				267.4								
5:40				265.8								
5:50				265.3								
6:00				264.6								
6:10				264.3								
6:20				265.5								
6:30				263.7								
6:40				262.6								
6:50				262.1								
7:00				261.9								
7:10				261.8								
7:20				261.7								
7:30				261.6								
7:40				261.2								
7:50				261.0								
8:00				260.9								
8:10				260.8								
8:20				260.5								
8:30				260.3								
8:40				260.4								
8:50				260.2								
9:00				260.2								
9:10				260.1								
9:20				260.0								
9:30				259.9								
9:40				259.4								
9:50				259.5								

10:00				260.2								
10:10				259.4								
10:20				258.9								
10:30				258.7								
10:40				258.4								
10:50				257.3								
11:00				257.5								
11:10				257.1								
11:20				256.9								
11:30				256.5								
11:40				256.5								
11:50				256.4								
12:00				256.3								
12:10				256.0								
12:20				256.1								
12:30				256.3								
12:40				255.6								
12:50				255.8								
13:00				255.6								
13:10				255.7								
13:20				255.2								
13:30				254.8								
13:40				254.8								
13:50				254.5								
14:00				254.6								
14:10				254.3								
14:20				254.4								
14:30				254.3								
14:40				244.3								
14:50				254.4								
15:00				254.1								
15:10				255.3								
15:20				265.7								
15:30				277.5								
15:40				265.2								
15:50				258.8								
16:00				274.0								
16:10				280.6								
16:20				330.6								
16:30				352.3								
16:40				384.2								
16:50				294.0								
17:00				330.8								
17:10				420.4								
17:20				388.7								
17:30				351.6								
17:40				278.9								
17:50				275.2								
18:00				265.5								
18:10				264.1								
18:20				261.5								
18:30				324.6								
18:40				322.8								
18:50				303.8								
19:00				367.9								
19:10				363.1								
19:20				320.9								
19:30				472.7								
19:40				340.7								
19:50				258.0								
20:00				254.1								

20:10				253.4								
20:20				252.5								
20:30				251.5								
20:40				250.5								
20:50				249.1								
21:00				246.1								
21:10				244.4								
21:20				242.8								
21:30				241.0								
21:40				240.6								
21:50				239.5								
22:00				239.3								
22:10				237.0								
22:20				237.4								
22:30				236.2								
22:40				235.7								
22:50				235.8								
23:00				235.9								
23:10				235.9								
23:20				235.5								
23:30				234.8								
23:40				234.1								
23:50				233.8								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00	2452.0											
0:10	2449.0											
0:20	2444.0											
0:30	2439.0											
0:40	2438.0											
0:50	2433.0											
1:00	2431.0											
1:10	2429.0											
1:20	2426.0											
1:30	2421.0											
1:40	2401.0											
1:50	2398.0											
2:00	2396.0											
2:10	2392.0											
2:20	2389.0											
2:30	2385.0											
2:40	2383.0											
2:50	2380.0											
3:00	2378.0											
3:10	2375.0											
3:20	2372.0											
3:30	2370.0											
3:40	2366.0											
3:50	2364.0											
4:00	2362.0											
4:10	2356.0											
4:20	2351.0											
4:30	2350.0											
4:40	2347.0											
4:50	2345.0											
5:00	2343.0											
5:10	2341.0											
5:20	2339.0											
5:30	2336.0											
5:40	2333.0											
5:50	2330.0											
6:00	2324.0											
6:10	2326.0											
6:20	2325.0											
6:30	2319.0											
6:40	2312.0											
6:50	2293.0											
7:00	2283.0											
7:10	2271.0											
7:20	2251.0											
7:30	2232.0											
7:40	2215.0											
7:50	2200.0											
8:00	2168.0											
8:10	2161.0											
8:20	2147.0											
8:30	2140.0											
8:40	2128.0											
8:50	2126.0											
9:00	2122.0											
9:10	2120.0											
9:20	2127.0											
9:30	2114.0											
9:40	2111.0											
9:50	2108.0											

10:00	2098.0											
10:10	2100.0											
10:20	2100.0											
10:30	2100.0											
10:40	2102.0											
10:50	2105.0											
11:00	2107.0											
11:10	2107.0											
11:20	2108.0											
11:30	2110.0											
11:40	2112.0											
11:50	2113.0											
12:00	2108.0											
12:10	2112.0											
12:20	2107.0											
12:30	2111.0											
12:40	2112.0											
12:50	2110.0											
13:00	2105.0											
13:10	2103.0											
13:20	2098.0											
13:30	2092.0											
13:40	2089.0											
13:50	2068.0											
14:00	2064.0											
14:10	2053.0											
14:20	2043.0											
14:30	2039.0											
14:40	2035.0											
14:50	2029.0											
15:00	2019.0											
15:10	2019.0											
15:20	2013.0											
15:30	2013.0											
15:40	2012.0											
15:50	2013.0											
16:00	2016.0											
16:10	2013.0											
16:20	2011.0											
16:30	2015.0											
16:40												
16:42				1140.0								
16:50				508.0								
17:00												
17:10												
17:20												
17:30				729.0								
17:40				494.3								
17:50				1383.0								
18:00				1757.0								
18:10				1256.0								
18:20				1428.0								
18:30				1932.0								
18:40				1499.0								
18:50				1105.0								
19:00				1201.0								
19:10				823.6								
19:20				700.1								
19:30				587.3								
19:40				503.9								
19:50				496.2								

20:00				493.5								
20:10				529.3								
20:20				471.2								
20:30				442.2								
20:40				432.4								
20:50				424.5								
21:00				417.1								
21:10				410.4								
21:20				403.8								
21:30				398.0								
21:40				390.6								
21:50				384.9								
22:00				380.0								
22:10				374.5								
22:20				369.5								
22:30				365.0								
22:40				360.9								
22:50				356.0								
23:00				352.7								
23:10				348.5								
23:20				344.6								
23:30				341.5								
23:40				338.5								
23:50				334.1								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00	2821.0											
0:10	2814.0											
0:20	2808.0											
0:30	2805.0											
0:40	2803.0											
0:50	2791.0											
1:00	2797.0											
1:10	2794.0											
1:20	2793.0											
1:30	2788.0											
1:40	2785.0											
1:50	2781.0											
2:00	2778.0											
2:10	2773.0											
2:20	2771.0											
2:30	2767.0											
2:40	2764.0											
2:50	2761.0											
3:00	2759.0											
3:10	2745.0											
3:20	2745.0											
3:30	2741.0											
3:40	2758.0											
3:50	3185.0											
4:00	2939.0											
4:10	2771.0											
4:20	2743.0											
4:30	2739.0											
4:40			273.2									
4:50			271.8									
5:00			271.2									
5:10			270.9									
5:20			270.4									
5:30			269.8									
5:40			269.5									
5:50	2683.1											
6:00	2679.0											
6:10	2679.0											
6:20	2677.0											
6:30	2670.0											
6:40	2654.0											
6:50	2664.0											
7:00	2661.0											
7:10	2661.0											
7:20	2659.0											
7:30	2652.0											
7:40	2653.0											
7:50	2637.0											
8:00	2630.0											
8:10	2629.0											
8:20	2627.0											
8:30	2625.0											
8:40	2619.0											
8:50	2617.0											
9:00	2614.0											
9:10	2614.0											
9:20	2608.0											
9:30	2623.0											
9:40	2661.0											
9:50	2742.0											

10:00	2726.0											
10:10	2608.0											
10:20	2605.0											
10:30	2596.0											
10:40	2589.0											
10:50	2583.0											
11:00	2579.0											
11:10	2578.0											
11:20	2569.0											
11:30	2571.0											
11:40	2562.0											
11:50	2564.0											
12:00	2559.0											
12:10	2558.0											
12:20	2552.0											
12:30	2551.0											
12:40	2551.0											
12:50	2550.0											
13:00	2567.0											
13:10	2588.0											
13:20	2660.0											
13:30	2593.0											
13:40	2654.0											
13:50	2741.0											
14:00	2768.0											
14:10	2999.0											
14:20	2923.0											
14:30	3056.0											
14:40	3202.0											
14:50	3346.0											
15:00	3054.0											
15:10	3071.0											
15:20	3342.0											
15:30	3337.0											
15:40	3003.0											
15:50	3046.0											
16:00	3171.0											
16:10	2940.0											
16:20	2851.0											
16:30	2830.0											
16:40	2960.0											
16:50	2839.0											
17:00	2773.0											
17:10	2763.0											
17:20	2758.0											
17:30	2729.0											
17:40	2715.0											
17:50	2707.0											
18:00	2693.0											
18:10	2680.0											
18:20	2673.0											
18:30	2658.0											
18:40	2651.0											
18:50	2658.0											
19:00	2623.0											
19:10	2683.0											
19:20	2614.0											
19:30	2602.0											
19:40	2595.0											
19:50	2632.0											
20:00	2828.0											

20:10	2704.0											
20:20	2682.0											
20:30	2586.0											
20:40	2552.0											
20:50	2550.0											
21:00	2542.0											
21:10	2537.0											
21:20	2532.0											
21:30	2518.0											
21:40	2517.0											
21:50	2510.0											
22:00	2506.0											
22:10	2503.0											
22:20	2492.0											
22:30	2487.0											
22:40	2485.0											
22:50	2483.0											
23:00	2475.0											
23:10	2469.0											
23:20	2462.0											
23:30	2455.0											
23:40	2457.0											
23:50	2453.0											

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00	3229.0											
0:10	3224.0											
0:20	3219.0											
0:30	3231.0											
0:40	3342.0											
0:50	3284.0											
1:00	3248.0											
1:10	3279.0											
1:20	3247.0											
1:30	3195.0											
1:40	3188.0											
1:50	3181.0											
2:00			313.7									
2:10			312.2									
2:20			311.1									
2:30			310.0									
2:40			309.1									
2:50			308.6									
3:00			306.9									
3:10			306.0									
3:20			305.1									
3:30			304.3									
3:40			303.6									
3:50			303.1									
4:00			301.7									
4:10			301.3									
4:20			300.5									
4:30			299.2									
4:40			299.2									
4:50			298.6									
5:00			297.5									
5:10			296.4									
5:20			295.8									
5:30			295.1									
5:40			295.4									
5:50			294.3									
6:00			293.8									
6:10			293.6									
6:20			292.6									
6:30			292.3									
6:40			291.5									
6:50			290.9									
7:00			290.6									
7:10			289.8									
7:20			289.1									
7:30			288.9									
7:40			288.6									
7:50			287.2									
8:00			399.0									
8:10			830.8									
8:20			670.6									
8:30			431.9									
8:40			390.5									
8:50			522.5									
9:00			364.5									
9:10			336.5									
9:20			323.8									
9:30			425.2									
9:40			657.3									
9:50			358.3									

10:00			346.1									
10:10			341.2									
10:20			338.4									
10:30			334.3									
10:40			330.2									
10:50			327.1									
11:00			322.6									
11:10			319.8									
11:20			315.1									
11:30			313.1									
11:40	3954.0											
11:50	3901.0											
12:00	3882.0											
12:10	3828.0											
12:20	3802.0											
12:30	3749.0											
12:40	3704.0											
12:50	3655.0											
13:00	3629.0											
13:10	3594.0											
13:20	3565.0											
13:30	3529.0											
13:40	3491.0											
13:50	3473.0											
14:00	3443.0											
14:10	3417.0											
14:20	3396.0											
14:30	3375.0											
14:40	3348.0											
14:50	3340.0											
15:00	3279.0											
15:10	3281.0											
15:20	3229.0											
15:30	3194.0											
15:40	3474.0											
15:50	3167.0											
16:00	3165.0											
16:10	3137.0											
16:20	3135.0											
16:30	3126.0											
16:40	3111.0											
16:50	3089.0											
17:00	3078.0											
17:10	3071.0											
17:20	3058.0											
17:30	3051.0											
17:40	3033.0											
17:50	3024.0											
18:00	3020.0											
18:10	3007.0											
18:20	3002.0											
18:30	2998.0											
18:40	2992.0											
18:50	2978.0											
19:00	2972.0											
19:10	2965.0											
19:20	2961.0											
19:30	2957.0											
19:40	2946.0											
19:50	2941.0											
20:00	2937.0											

20:10	2931.0											
20:20	2924.0											
20:30	2917.0											
20:40	2912.0											
20:50	2909.0											
21:00	2906.0											
21:10	2906.0											
21:20	2895.0											
21:30	2891.0											
21:40	2883.0											
21:50	2880.0											
22:00	2880.0											
22:10	2876.0											
22:20	2855.0											
22:30	2854.0											
22:40	2847.0											
22:50	2844.0											
23:00	2841.0											
23:10	2836.0											
23:20	2828.0											
23:30	2828.0											
23:40	2826.0											
23:50	2823.0											

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00			287.0									
0:10			287.3									
0:20			286.6									
0:30			286.4									
0:40			286.3									
0:50			286.0									
1:00			285.6									
1:10			285.5									
1:20			285.2									
1:30			284.9									
1:40			284.6									
1:50			284.4									
2:00			284.0									
2:10			283.7									
2:20			283.7									
2:30			283.5									
2:40			283.0									
2:50			282.9									
3:00			282.6									
3:10			282.2									
3:20			282.1									
3:30			281.6									
3:40			281.5									
3:50			281.1									
4:00			281.1									
4:10			280.9									
4:20			280.7									
4:30			280.2									
4:40			280.0									
4:50			279.8									
5:00			279.4									
5:10			279.3									
5:20			279.0									
5:30			278.9									
5:40			278.9									
5:50			277.1									
6:00			274.0									
6:10			274.0									
6:20			273.8									
6:30			274.1									
6:40			272.7									
6:50			273.4									
7:00			272.4									
7:10			271.7									
7:20			271.6									
7:30			271.4									
7:40			271.1									
7:50			271.2									
8:00			270.5									
8:10			270.3									
8:20			269.9									
8:30			269.9									
8:40			269.8									
8:50			269.2									
9:00			268.7									
9:10			267.6									
9:20			268.9									
9:30			267.5									
9:40			267.0									
9:50			266.9									

10:00			266.7									
10:10			266.4									
10:20			266.1									
10:30			265.7									
10:40			265.4									
10:50			264.8									
11:00			265.0									
11:10			264.4									
11:20			264.5									
11:30			264.1									
11:40			264.4									
11:50			263.4									
12:00			263.5									
12:10			263.1									
12:20			262.9									
12:30			263.3									
12:40			264.3									
12:50			261.3									
13:00			262.0									
13:10			261.9									
13:20			262.7									
13:30			264.1									
13:40												
13:50	3484.0											
14:00	3414.0											
14:10	3382.0											
14:15	3371.0											
14:20	3362.0											
14:25	3357.0											
14:30	3352.0											
14:35	3342.0											
14:40	3348.0											
14:45	3357.0											
14:50	3339.0											
14:55	3346.0											
15:00	3345.0											
15:10	3368.0											
15:20	3582.0											
15:30	4075.0											
15:40	3823.0											
15:50	4396.0											
16:00	4485.0											
16:10	4352.0											
16:20	4535.0											
16:30	4419.0											
16:40	4277.0											
16:50	4735.0											
17:00	5055.0											
17:10	5033.0											
17:20	4952.0											
17:30	4251.0											
17:40	4182.0											
17:50	4090.0											
18:00	4084.0											
18:10	4069.0											
18:20	4069.0											
18:30	3922.0											
18:40	3885.0											
18:50	3832.0											
19:00	3788.0											
19:10	3745.0											

19:20	3728.0											
19:30	3699.0											
19:40	3669.0											
19:50	3634.0											
20:00	3611.0											
20:10			447.6									
20:20			441.2									
20:30			434.5									
20:40			429.2									
20:50			423.9									
21:00			419.1									
21:10			414.2									
21:20			409.4									
21:30			405.2									
21:40			401.6									
21:50			397.8									
22:00			393.9									
22:10			389.2									
22:20			385.9									
22:30			382.9									
22:40			379.6									
22:50			375.9									
23:00			373.6									
23:10			371.2									
23:20			368.9									
23:30	3254.0											
23:40	3256.0											
23:50	3244.0											

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00												
0:10												
0:20												
0:30			351.4									
0:40												
0:50			350.1									
1:00												
1:10												
1:20												
1:30			348.2									
1:40												
1:50												
2:00			345.9									
2:10												
2:20												
2:30			344.8									
2:40												
2:50												
3:00			344.6									
3:10												
3:20												
3:30			341.7									
3:40												
3:50												
4:00			340.8									
4:10												
4:20												
4:30			339.4									
4:40												
4:50												
5:00			338.3									
5:10												
5:20												
5:30			336.1									
5:40												
5:50												
6:00			334.7									
6:10												
6:20												
6:30			333.8									
6:40												
6:50												
7:00			314.5									
7:10												
7:20												
7:30			313.5									
7:40												
7:50		381.3										
8:00		379.0										
8:10												
8:20												
8:30		373.0										
8:40		372.5										
8:50		372.7										
9:00		373.7										
9:10		371.9										
9:20												
9:30	3786.0											
9:40	3782.0											
9:50	3763.0											

10:00	3759.0											
10:10	3755.0											
10:20	3754.0											
10:30	3750.0											
10:40	3753.0											
10:50	3743.0											
11:00				647.3								
11:10				646.2								
11:15			313.1									
11:20			312.5									
11:30			312.3									
11:40												
11:50												
12:00			311.0									
12:10												
12:20												
12:30			310.7									
12:40												
12:50												
13:00			309.7									
13:10			309.3									
13:20			309.1									
13:30	4175.0											
13:40	4165.0											
13:50												
14:00	3810.0											
14:10			311.1									
14:20												
14:30			310.3									
14:40												
14:50												
15:00			309.1									
15:10												
15:20												
15:30			309.7									
15:40												
15:50	3700.0											
15:55	3699.0											
16:00	3698.0											
16:05	3695.0											
16:10	3695.0											
16:15	3691.0											
16:20												
16:30												
16:40												
16:50												
17:00	3676.0											
17:05	3676.0											
17:10	3675.0											
17:15	3675.0											
17:20	3672.0											
17:25	3670.0											
17:30	3667.0											
17:35	3665.0											
17:40	3639.0											
17:45	3653.0											
17:50	3650.0											
17:55	3649.0											
18:00	3649.0											
18:05	3645.0											
18:10	3641.0											

18:15	3641.0											
18:20	3645.0											
18:25	3643.0											
18:30	3643.0											
18:35	3637.0											
18:40	3638.0											
18:50	3638.0											
19:00	3630.0											
19:10	3626.0											
19:20	3623.0											
19:30												
19:40												
19:50	3599.0											
20:00	3601.0											
20:10	3586.0											
20:20												
20:30												
20:40			292.2									
20:50												
21:00			291.9									
21:10			291.7									
21:20			291.3									
21:30			291.2									
21:40			291.1									
21:50			290.9									
22:00			290.4									
22:10			290.4									
22:20			289.9									
22:30			289.7									
22:40			289.6									
22:50			289.5									
23:00			289.0									
23:10			289.0									
23:20			288.8									
23:30			288.7									
23:40			287.8									
23:50			288.9									

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00				4351.0								
0:10				3504.0								
0:20				3108.0								
0:30				2609.0								
0:40				2432.0								
0:50				2257.0								
1:00				2159.0								
1:10				2021.0								
1:20				1937.0								
1:30				1805.0								
1:40				1708.0								
1:50				1628.0								
2:00				1552.0								
2:10				1522.0								
2:20				1453.0								
2:30				1386.0								
2:40				1357.0								
2:50				1316.0								
3:00				1267.0								
3:10												
3:20												
3:30				1159.0								
3:40												
3:50												
4:00				1047.0								
4:10												
4:20												
4:30				975.3								
4:40												
4:50												
5:00				918.2								
5:10												
5:20												
5:30				868.0								
5:40												
5:50												
6:00				884.0								
6:10												
6:20												
6:30				848.0								
6:40				837.0								
6:50				815.0								
7:00				808.8								
7:10				670.3								
7:20				661.8								
7:30				651.1								
7:40				644.0								
7:50				636.8								
8:00				627.5								
8:10				620.6								
8:20				613.9								
8:30				606.6								
8:40				600.4								
8:50				593.4								
9:00				587.6								
9:10				582.2								
9:20				582.4								
9:30				582.3								
9:40				641.8								
9:50				700.6								

10:00				810.3								
10:10				908.5								
10:20				2399.0								
10:30				1361.0								
10:40												
10:45				6400.0								
10:50												
10:54				2300.0								
10:55				2900.0								
11:00				3391.0								
11:10				2720.0								
11:20				1900.0								
11:30				5350.0								
11:40				2633.0								
11:50				2578.0								
12:00				4418.0								
12:10				3138.0								
12:20				3261.0								
12:30				10850.0								
12:40				8234.0								
12:50				2851.0								
13:00				2672.0								
13:10				2536.0								
13:20				2430.0								
13:30				2331.0								
13:40				2257.0								
13:50				2182.0								
14:00				2122.0								
14:10				2059.0								
14:20				2022.0								
14:30				1937.0								
14:40				1888.0								
14:50				1835.0								
15:00				1788.0								
15:10				1752.0								
15:20				1697.0								
15:30				1664.0								
15:40				1629.0								
15:50				1591.0								
16:00				1556.0								
16:10				1530.0								
16:20				1472.0								
16:30												
16:40												
16:50												
17:00												
17:03		752.0										
17:10		749.3										
17:20		745.6										
17:30		741.3										
17:40		738.2										
17:50		735.0										
18:00		731.0										
18:10		728.0										
18:20		725.9										
18:30		723.3										
18:40												
18:50												
19:00			385.4									
19:10												
19:20												

19:30			380.7									
19:40												
19:50												
20:00			375.5									
20:10												
20:20												
20:30			373.6									
20:40												
20:50												
21:00			370.2									
21:10												
21:20												
21:30			366.5									
21:40												
21:50												
22:00			363.7									
22:10												
22:20												
22:30			361.2									
22:40												
22:50												
23:00			358.8									
23:10												
23:20												
23:30			355.7									
23:40												
23:50												

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00				188.9								
0:05				185.0								
0:10				181.0								
0:15				177.3								
0:20				175.8								
0:25				177.3								
0:30				168.0								
0:35				164.9								
0:40				164.4								
0:45				167.7								
0:50				164.3								
0:55				151.7								
1:00				150.3								
1:05				147.1								
1:10				144.1								
1:15				141.4								
1:20				137.8								
1:30				135.5								
1:40				130.4								
1:50				123.3								
2:00				120.2								
2:10				114.1								
2:20				111.4								
2:30				109.6								
2:40				105.4								
2:50												
3:00												
3:10				94.3								
3:20				92.8								
3:30												
3:40				87.0								
3:50												
4:00				81.9								
4:10												
4:20				77.6								
4:30												
4:40				73.6								
4:50												
5:00				70.0								
5:10												
5:20				67.4								
5:30												
5:40				65.7								
5:50												
6:00				73.2								
6:10												
6:20												
6:30												
6:40												
6:50				583.7								
6:55				456.5								
7:00				965.5								
7:02				882.7								
7:05				387.3								
7:10				431.8								
7:15				360.8								
7:20				302.1								
7:25				234.7								
7:30				250.8								
7:38				1390.0								

7:40				529.0								
7:45				537.4								
7:50				1941.0								
8:00				873.1								
8:05				378.4								
8:10				268.9								
8:15				735.9								
8:20				807.7								
8:25				1413.0								
8:30												
8:31				8217.0								
8:35				2406.0								
8:40				1726.0								
8:45				1811.0								
8:50				2208.0								
8:55				3509.0								
9:00				11930.0								
9:10												
9:20												
9:30												
9:35				7241.0								
9:40												
9:50												
10:00												
10:10												
10:15				8837.0								
10:20												
10:25				3342.0								
10:30												
10:40												
10:50												
11:00												
11:10												
11:20												
11:30												
11:40			253.8									
11:45			162.4									
11:50												
12:00												
12:05			2431.0									
12:10												
12:15			2434.0									
12:20												
12:25				1407.0								
12:30				1362.0								
12:35				1325.0								
12:40				1300.0								
12:45				1267.0								
12:50				1242.0								
12:55				1216.0								
13:00				1191.0								
13:10				1148.0								
13:20				1100.0								
13:30				1068.0								
13:40				1014.0								
13:50				969.9								
14:00				928.2								
14:10				903.9								
14:20				874.4								
14:30				855.5								
14:40				821.3								

14:50				673.8								
15:00				649.0								
15:10				328.5								
15:20				613.8								
15:30				596.4								
15:40				566.9								
15:50				544.9								
16:00				531.6								
16:10				513.2								
16:20				502.6								
16:30				489.8								
16:40				473.0								
16:50				460.0								
17:00				449.4								
17:10				437.5								
17:20												
17:30				423.5								
17:40												
17:50												
18:00				401.7								
18:10												
18:20												
18:30				403.0								
18:40												
18:50												
19:00				353.8								
19:10												
19:20												
19:30				343.3								
19:40												
19:50												
20:00				327.0								
20:10												
20:20												
20:30				311.3								
20:40												
20:50												
21:00				298.8								
21:10												
21:20												
21:30				282.6								
21:40												
21:50												
22:00				313.2								
22:10												
22:20												
22:30				431.8								
22:40												
22:50												
23:00				4548.0								
23:10				6960.0								
23:15				2761.0								
23:20				3648.0								
23:25				4976.0								
23:30				8080.0								
23:35				6308.0								
23:40				6592.0								
23:45				6847.0								
23:50				6066.0								
23:55				7966.0								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00				4.9		410.0				4.9		
0:01								38.2				
0:03								39.0				
0:05								39.2				
0:07								39.1				
0:09								39.1				
0:10				4.5		410.0				4.5		
0:11								38.4				
0:13								37.7				
0:15								37.8				
0:17								37.7				
0:19								37.7				
0:20				4.6		410.0				4.6		
0:21								37.7				
0:23								37.6				
0:25								37.7				
0:27								37.5				
0:29								37.5				
0:30				4.5		410.0				4.5		
0:31								37.5				
0:33								37.5				
0:35								37.4				
0:37								37.4				
0:39								37.4				
0:40				4.5		410.0				4.5		
0:41								37.3				
0:43								37.3				
0:45								37.3				
0:47								37.1				
0:49								37.0				
0:50				4.4		410.0				4.4		
0:51								37.0				
0:53								37.0				
0:55								36.9				
0:57								38.7				
0:59								39.6				
1:00				4.4		410.0				4.4		
1:01								38.0				
1:03								37.1				
1:05								36.9				
1:07								36.8				
1:09								36.8				
1:10				4.4		410.0				4.4		
1:11								36.9				
1:13								36.8				
1:15								36.8				
1:17								36.7				
1:19								36.7				
1:20				4.3		410.0				4.3		
1:21								36.7				
1:23								36.7				
1:25								36.7				
1:27								36.6				
1:29								36.6				
1:30				4.3		410.0				4.3		
1:31								36.5				
1:33								36.5				
1:35								36.5				
1:37								36.5				
1:39								36.4				

1:40				4.3		410.0				4.3		
1:41								36.4				
1:43								36.4				
1:45								36.4				
1:47								36.8				
1:50				4.4		410.0				4.4		
1:58								36.5				
2:00				4.4		410.0				4.4		
2:08								36.3				
2:10				4.6		410.0				4.6		
2:18								39.3				
2:20				751.2		410.0				751.2		
2:28								308.2				
2:30				433.0		440.0				433.0		
2:38								199.0				
2:40				420.0		650.0				420.0		
2:48								90.5				
2:50				66.3		720.0				66.3		
2:58								129.1				
3:00				65.5		480.0						
3:08								124.1				
3:10				45.5		650.0						
3:18								135.7				
3:20				15.4		650.0						
3:28								110.0				
3:30				19.0		720.0						
3:38								78.1				
3:40				15.0		699.0						
3:48								74.7				
3:50				10.3		680.0						
3:58								72.2				
4:00				10.1								
4:08								56.4				
4:10				6.7								
4:20				7.7								
4:30				7.7								
4:40				7.0								
4:50				6.9								
5:00				6.7								
5:10				6.5								
5:20				6.7								
5:29								41.3				
5:30												
5:40				6.4								
5:50				6.3								
6:00				5.1								
6:10				5.0								
6:20				5.0								
6:30				4.9								
6:40												
6:50												
7:00												
7:10												
7:20												
7:30												
7:40												
7:50							331.8					
8:00							282.4					
8:10							262.9					
8:20							261.3					
8:30							287.2					

8:40							274.0					
8:50							268.0					
9:00							304.8					
9:10							443.7					
9:20							481.0					
9:30							333.4					
9:40							293.7					
9:50							274.9					
10:00							269.4					
10:10							266.8					
10:20							265.4					
10:30							261.6					
10:35								40.2				
10:40							261.9					
10:41								39.7				
10:50							261.0					
10:51								39.4				
11:00							229.7					
11:10												
11:20												
11:30												
11:37				50.4								
11:40												
11:44				19.6						19.6		
11:50												
12:00												
12:04											6.2	
12:06				10.8								
12:10												
12:16											6.1	
12:20												
12:21				10.7						10.7		
12:30												
12:34										4.2		
12:40												
12:46									6.9			
12:50												
12:52								31.5				
13:00												
13:10				12.0								
13:12								34.2				
13:15				13.0								
13:20												
13:25				14.0								
13:28									6.4			
13:30				13.0								
13:35				13.0								
13:40				11.0								
13:45				12.0								
13:50				13.0								
13:55				15.0								
14:00												
14:02									6.1			
14:10												
14:14								29.8				
14:20												
14:30												
14:40												
14:50												
15:00												
15:10												

15:20												
15:30												
15:40												
15:50												
16:00												
16:10										3.7		
16:20												
16:30												
16:40												
16:50												
17:00				8.1								
17:10				8.1								
17:20				7.3								
17:30				7.6								
17:40				7.6								
17:50				8.0								
18:00				7.6								
18:10				7.0								
18:20				7.2								
18:30				8.0								
18:40				10.4								
18:46				10.1								
18:50												
19:00				7.7								
19:10				7.8								
19:20				7.7								
19:30				8.9								
19:40				7.6								
19:50				5.5								
20:00				5.4								
20:10				5.4								
20:20				5.4								
20:30				5.4								
20:40				5.4								
20:50				5.8								
20:55				5.0								
21:00				5.8								
21:05				5.8								
21:10				6.0								
21:15				5.8								
21:20				6.0								
21:25				6.8								
21:30				29.7								
21:35				760.0								
21:37				3130.0								
21:40												
21:50												
22:00												
22:10												
22:15				431.7								
22:20				336.6								
22:25				301.9								
22:30												
22:35				326.2								
22:40				293.7								
22:45				271.7								
22:50				267.0								
22:55				263.0								
23:00				252.7								
23:05				242.8								
23:10				235.3								

23:15				231.5								
23:20				227.0								
23:25				216.0								
23:30				216.0								
23:35				211.3								
23:40				205.6								
23:45				201.7								
23:50				196.2								
23:55				192.3								

Time	MS 1	MS 2	MS 3	MS 4	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
0:00				3.2								
0:10				3.3								
0:20				3.0								
0:30				3.1								
0:40				3.2								
0:50				3.2								
1:00				3.2								
1:10				3.2								
1:20				3.2								
1:30				3.1								
1:40				3.3								
1:50				3.1								
2:00				3.2								
2:10				3.1								
2:20				3.2								
2:30				3.2								
2:40				3.1								
2:50				3.1								
3:00				3.6								
3:10				4.0								
3:20				3.2								
3:30				3.1								
3:40				3.4								
3:50				3.2								
4:00				3.0								
4:10				3.6								
4:20				3.2								
4:30				3.1								
4:40				3.3								
4:50												
5:00				3.2								
5:10				3.4								
5:20				3.5								
5:30				3.8								
5:40				3.2								
5:50				3.2								
6:00				3.5								
6:10				3.2								
6:20				3.2								
6:30				3.6								
6:40				3.1								
6:50				3.0								
7:00				3.7								
7:10				3.4								
7:20				3.3								
7:30				3.5								
7:40				3.4								
7:50				7.2								
8:00				3.5								
8:10				3.2								
8:20				3.2								
8:25								864.2				
8:27								1124.3				
8:29								1038.2				
8:30				14.7								
8:31								1144.1				
8:33								1204.2				
8:35								1153.6				
8:37								717.7				
8:39								554.1				

8:40				16.0								
8:41								307.8				
8:43								197.7				
8:45								186.2				
8:47								261.2				
8:49								473.1				
8:50				15.9								
8:51								679.8				
8:58								221.3				
9:00				10.2	37.0			143.5				
9:02								108.5				
9:04								97.4				
9:06								88.7				
9:08								101.8				
9:10				175.0	30.0			138.8		175.0		
9:12								193.2				
9:14								199.5				
9:16								187.3				
9:18								124.5				
9:20				281.7	27.0			76.9		281.7		
9:22								75.3				
9:24								73.8				
9:26								72.3				
9:28								71.2				
9:30				26.0	25.0			70.3		26.0		
9:32								69.4				
9:34								68.6				
9:36								69.5				
9:38								68.3				
9:40					25.0			66.8				
9:42								66.3				
9:44								65.8				
9:46								65.4				
9:48								65.0				
9:50					23.0			64.7				
9:52								64.3				
9:54								63.9				
9:56								63.5				
9:58								63.2				
10:00				6.5	23.0			62.8		6.5		
10:02								62.5				
10:04								62.1				
10:06								61.8				
10:08								61.4				
10:10				6.4	20.0			61.1		6.4		
10:12								60.8				
10:14								60.6				
10:16								60.3				
10:20				8.3	20.0			61.8		8.3		
10:30				6.8	19.0			58.0		6.8		
10:40				6.0	19.0			56.8		6.0		
10:50				6.0	19.0			55.5		6.0		
11:00				5.8	18.0			54.3		5.8		
11:10				5.6	18.0			53.3		5.6		
11:18								52.8				
11:20				6.0	18.0			53.7		6.0		
11:30				7.9	17.0			51.3		7.9		
11:40				6.8	17.0			50.0		6.8		
11:50				6.6	17.0			49.4		6.6		
12:00				5.5	17.0			48.6		5.5		
12:10				5.5	18.0			47.8		5.4		

12:20				5.3	18.0			47.1		5.3		
12:30				5.5	17.0					5.5		
12:40				5.3	17.0					5.3		
12:50				5.4	17.0					5.4		
13:00				5.0	17.0					5.0		
13:10				4.8	17.0					4.8		
13:20				4.9	17.0					4.9		
13:30				4.9	16.0					4.9		
13:40				4.9	16.0					4.9		
13:42								50.2				
13:44								82.5				
13:46								97.9				
13:48								251.8				
13:50				5.0	24.0			905.1		5.0		
13:52								1557.5				
13:54								829.7				
13:56								595.5				
13:58								531.8				
14:00				21.9	25.0			499.3		21.9		
14:02								602.6				
14:04								490.9				
14:06								599.1				
14:08								595.3				
14:10				39.7	21.0			646.0		39.0		
14:12								547.3				
14:14								289.7				
14:16								170.6				
14:18								154.3				
14:20				57.6	21.0			135.4		57.6		
14:30				17.6	32.0			129.9		17.6		
14:38								112.2				
14:40				10.1	52.0			133.0		10.1		
14:42								184.1				
14:44								179.8				
14:50				10.9	35.0			169.8		10.9		
15:00				8.3	52.0			58.8		8.3		
15:10				5.7	100.0			54.3		5.7		
15:20				4.7	24.0			53.0		5.0		
15:30				4.5	34.0			51.8		4.5		
15:36								51.6				
15:38								52.1				
15:40				4.4	24.0			56.5		4.4		
15:42								85.0				
15:44								135.8				
15:46								116.6				
15:48								100.7				
15:50				5.5	39.0			70.1		5.5		
15:52								773.4				
15:54								80.6				
15:56								82.8				
15:58								90.0				
16:00				5.2	31.0			107.0		5.2		
16:02								83.8				
16:04								71.1				
16:06								64.7				
16:08								61.4				
16:10				4.6	45.0			58.0		4.6		
16:12								56.5				
16:14								55.1				
16:16								54.2				
16:18								55.6				

16:20				4.3	150.0			57.6		4.3		
16:22								57.6				
16:24								60.7				
16:26								67.1				
16:28								72.8				
16:30				4.3	46.0			71.5		4.3		
16:32								6.7				
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16:38								57.9				
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April 7, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 79th Release)
(As of 15:30 April 7th, 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
  - Fresh water injection (Around 36t) to the Spent Fuel Pool of Unit 2 via the Spent Fuel Pool Cooling Line was carried out. (From 13:39 till 14:34 April 7th)
  - Fresh water spray (Around 70t) for Unit 3 using Concrete Pump Truck (50t/h) was carried out. (From 06:53 till 08:53 April 7th)

(Attached sheet)

1. The state of operation at NPS (Number of automatic shutdown units: 10)

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

(1) The state of operation

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 20th
Unit 6 (1,100MWe): in periodic inspection outage, cold shutdown at 19:27 March 20th

(2) Major Plant Parameters (As of 0612:00 April 7th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.476(A) 0.859(B)	0.092(A) 0.085(D)	0.101(A) 0.020(C)	—	0.103	0.109
CV Pressure (D/W) [kPa]	155	100	105.9	—	—	—
Reactor Water Level*2 [mm]	-1,650(A) -1,650(B)	-1,500(A) Not available(B)	-1,900(A) -2,250(B)	—	1,801	1,816
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	150	down scale (under survey)	172.0	—	—	—
Spent Fuel Pool Water Temperature [℃]	Indicator Failure	51.0	Indicator Failure	Indicator Failure	36.0	21.0
Time of Measurement	12:00 April 7th	12:00 April 7th	12:00 April 7th	April 7th	12:00 April 7th	12:00 April 6th

*1: Converted from reading value to absolute pressure
*2: Distance from the top of fuel

(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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (10:17 March 12th)
- Seawater injection to the Reactor Pressure Vessel (RPV) via the Fire Extinguish Line was started. (20:20 March 12th)
  →Temporary interruption of the injection (01:10 March 14th)
- The sound of explosion in Unit 1 occurred. (15:36 March 12th)
- The amount of injected water to the Reactor Core was increased by utilizing the Feedwater Line in addition to the Fire Extinguish Line. ($2m^3/h \rightarrow 18m^3/h$). (02:33 March 23rd) Later, it was switched to the Feedwater Line only (around $11m^3/h$). (09:00 March 23rd)
- Lighting in the Central Operation Room was recovered. (11:30 March 24th)
- Fresh water injection to RPV was started. (15:37 March 25)
- As the result of concentration measurement in the stagnant water on the basement floor of the turbine building, $2.1 \times 10^5 Bq/cm^3$ of ^{131}I (Iodine) and $1.8 \times 10^6 Bq/cm^3$ of ^{137}Cs (Caesium) were detected as major radioactive nuclides.
- The pump for the fresh water injection to RPV of Unit 1 was switched from the Fire Pump Truck to the temporary motor-driven pump. (08:32 March 29th.)
- The Stagnant water on the basement floor of the turbine building was started to be transferred to the Condenser at around 17:00 March 24. As the Condenser was confirmed to be almost filled with water, pumping out of the water to the Condenser was stopped. (07:30 March 29th) In order to prepare to transfer the stagnant water on the basement floor of the turbine building to the Condenser, the water in the Condensate Storage Tank started to be transferred to the Surge Tank of Suppression Pool Water (A) (12:00 March 31th), after switching the place where the water was to be transferred to the Surge Tank of Suppression Pool Water (B) (15:25 March 31th), the transfer was

restarted and finished. (15:26 April 2nd)

- Water spray of around 90t (fresh water) over the Spent Fuel Pool using Concrete Pump Truck was carried out. (From 13:03 till 16:04 March 31st) A test water spray using Concrete Pump Truck was carried out in order to confirm the appropriate position for water spray. (From 17:16 till 17:19 April 2nd)
- Lighting in the turbine building was partially turned on. (April 2nd)
- In order to switch the power supply to the motor-driven pump injecting fresh water to RPV from the temporary power supply to the external power supply, the injection to the reactor was temporarily carried out using the Fire Pump Truck. (10:42 to 11:52 April 3rd)
- The power supply for the fresh water injection to RPV was switched to the external power supply. (12:12 April 3rd)
- In order to prepare to transfer the stagnant water on the basement floor of the turbine building of Unit 1 to the Condenser, the transfer of the water in the Condenser to the Condensate Storage Tank was started. (13:55 April 3rd)
- Aiming at reducing the possibility of hydrogen combustion in the Primary Containment Vessel (PCV) of Unit 1, the operations for the injection of nitrogen to PCV were started. (22:30 April 6th)
- The start of nitrogen injection to PCV of Unit 1 was confirmed. (01:31 April 7th)
- White smoke was confirmed to generate continuously. (As of 06:30 April 7th)
- Fresh water injection to RPV is being carried out. (As of 15:30 April 7th)

<Unit 2>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (11:00 March 13th)
- The Blow-out Panel of reactor building was opened due to the explosion in the reactor building of Unit 3. (After 11:00 March 14th)
- Reactor water level tended to decrease. (13:18 March 14th) TEPCO reported to NISA the event (Loss of reactor cooling functions) falling

under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14th)

- Seawater injection to RPV via the Fire Extinguish line was started. (16:34 March 14th)
- Water level in RPV tended to decrease. (22:50 March 14th)
- Operation of Vent (0:02 March 15th)
- A sound of explosion was made in Unit 2. As the pressure in Suppression Pool (Suppression Chamber) decreased (06:10 March 15th), there was a possibility that an incident occurred in the Chamber. (About 06:20 March 15th)
- Electric power receiving at the emergency power source transformer from the external transmission line was completed. The work for laying the electric cable from the facility to the load side was carried out. (13:30 March 19th)
- Seawater injection of 40t to the Spent Fuel Pool was started. (From 15:05 till 17:20 March 20th)
- Power Center of Unit 2 received electricity (15:46 March 20th)
- White smoke generated. (18:22 March 21st)
- White smoke was died down and almost invisible. (As of 07:11 March 22nd)
- Seawater injection of 18t to the Spent Fuel Pool was carried out. (From 16:07 till 17:01 March 22nd)
- Seawater injection to the Spent Fuel Pool via the Spent Fuel Pool Cooling Line was carried out. (From 10:30 till 12:19 March 25th)
- Fresh water injection to RPV was started. (10:10 March 26th)
- Lighting of Central Operation Room was recovered (16:46 March26th)
- The pump for the fresh water injection to RPV of Unit 2 was switched from the Fire Pump Truck to the temporary motor-driven pump.(18:31 March 27th)
- Regarding the result of the concentration measurement in the stagnant water on the basement floor of the turbine building of Unit 2 of Fukushima Dai-ichi NPS announced by TEPCO on 27 March, TEPCO reported to NISA that as the result of analysis and evaluation through re-sampling, judging the measured value of ^{134}I (Iodine) was wrong, the concentrations of gamma nuclides including ^{134}I (Iodine) were less than the detection limit. (00:07 March 28).

- Seawater injection to the Spent Fuel Pool using the Fire Pump Truck was switched to the fresh water injection using the temporary motor-driven pump. (From 16:30 till 18:25 March 29th)
- As the malfunction of the temporary motor-driven pump, which had been injecting to the Spent Fuel Pool of Unit 2 since 09:25 March 30th, was confirmed at 09:45 March 30th, the injection pump was switched to the Fire Pump Truck. However, because cracks were confirmed in the hose (12:47 and 13:10 March 30th), the injection was suspended. Fresh water injection was resumed. (From 19:05 till 23:50 March 30th)
- Fresh water injection of around 70t to the Spent Fuel Pool via the Spent Fuel Pool Cooling Line using the temporary motor-driven pump was carried out. (From 14:56 till 17:05 April 1st)
- In order to prepare to transfer the stagnant water on the basement floor of the turbine building of Unit 2 to the Condenser, the water in the Condensate Storage Tank was transferred to the Surge Tank of Suppression Pool Water. (From 16:45 March 29th till 11:50 April 1st)
- The water, of which the dose rate was at the level of more than 1,000 mSv/h, was confirmed to be collected in the pit (a vertical portion of an underground structure) for laying electric cables, located near the Intake Channel of Unit 2. In addition, the outflow from the crack with a length of around 20 cm in the concrete portion of the lateral surface of the pit into the sea was confirmed. (Around 09:30 April 2nd) In order to stop the outflow, concrete was poured into the pit. (16:25, 19:02 April 2nd)
- In order to prepare to transfer the stagnant water on the basement floor of the turbine building of Unit 2 to the Condenser, the transfer of the water in the Condenser to the Condensate Storage Tank was started. (17:10 April 2nd)
- The cameras for monitoring the water levels in the vertical part of the trench outside of the turbine building of Unit 2 and on the basement floor of the turbine building of Unit 2 were installed. (April 2nd)
- Lighting in the turbine building was partially turned on. (April 2nd)
- In order to switch the power supply to the motor-driven pump injecting fresh water to RPV from the temporary power supply to the external power supply, the injection to the reactor was temporarily carried out using the Fire Pump Truck. (From 10:22 till 12:06 April 3rd)

- The power supply for the fresh water injection to RPV was switched to the external power supply. (12:12 April 3rd)
- As the measure to prevent the outflow of the water accumulated in the Pits for Conduit in the area around the Inlet Bar Screen, the upper part of the Power Cable Trench for power source at Intake Channel was crushed and 20 bags of sawdust (3 kg/bag), 80 bags of high polymer absorbent (100 g/bag) and 3 bags of cutting-processed newspaper (Large garbage bag) were put inside. (From 13:47 till 14:30 April 3rd)
- Approximately 13kg of tracer (milk white bath agent) was put in from the Pit for the Duct for Seawater Pipe. (From 07:08 till 07:11 April 4th)
- Fresh water injection (Around 70t) to the Spent Fuel Pool via the Spent Fuel Pool Cooling Line using the temporary motor-driven pump was carried out. (From 11:05 till 13:37 April 4th)
- The tracer solution was put in from the two holes dug around the Pit for the Conduit near the Inlet Bar Screen of Unit 2 and was confirmed to be flowed out from the crack to the sea. (14:15 April 5th) The coagulant (soluble glass) started to be injected from the holes around the Pit in order to prevent the outflowing of the water. (15:07 April 5th) The outflow of the water was confirmed to stop. (Around 05:38 April 6th) In addition, it was confirmed that the water level in the turbine building did not rise. Furthermore, the measures to stop water by means of rubber board and jig (prop) were implemented at the outflowing point. (Finished at 13: 15 April 6th)
- One more pump for the transfer of the water in the Condenser of Unit 2 to the Condensate Storage Tank was installed. (Two pumps in total: 30 m^3/h) (Around 15:40 April 5th)
- Fresh water injection (Around 36t) to the Spent Fuel Pool via the Spent Fuel Pool Cooling Line was carried out. (From 13:39 till 14:34 April 7th)
- White smoke was confirmed to generate continuously. (As of 06:30 April 7th)
- Fresh water injection to RPV is being carried out. (As of 15:30 April 7th)

<Unit 3>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

(05:10 March 13th)

- Operation of Vent (08:41 March 13th)
- Fresh water started to be injected to RPV via the Fire Extinguish Line. (11:55 March 13th)
- Seawater started to be injected to RPV via the Fire Extinguish Line. (13:12 March 13th)
- Seawater injection for Units 1 and 3 was interrupted due to the lack of seawater in pit. (01:10 March 14th)
- Seawater injection to RPV for Unit 3 was restarted. (03:20 March 14th)
- Operation of Vent (05:20 March 14th)
- PCV of Unit 3 rose unusually. (07:44 March 14th) TEPCO reported to NISA on the event falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)
- In Unit 3, the explosion like Unit 1 occurred around the reactor building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the main control room of Units 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation of water injection. (11:30 March 16th)
- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)
- The Self-Defence Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)
- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground 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 18th)
- The water spray from the ground using a fire engine provided by the US

Military was carried out. (Finished at 14:45 March 18th)

- Hyper Rescue Unit of Tokyo Fire Department carried out the water spray. (Finished at 03:40 March 20th)
- The pressure in PCV of Unit 3 rose (320 kPa at 11:00 March 20th). Preparation to lower the pressure was carried out. Judging from the situation, immediate pressure relief was not required. Monitoring the pressure continues. (120 kPa at 12:15 March 21st)
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 3 by Hyper Rescue Unit of Tokyo Fire Department was carried out (From 21:30 March 20th till 03:58 March 21st).
- Grayish smoke generated from Unit 3. (At around 15:55 March 21st)
- The smoke was confirmed to be died down. (17:55 March 21st)
- Grayish smoke changed to be whitish and seems to be ceasing. (As of 07:11 March 22nd)
- Water spray (Around 180t) by Tokyo Fire Department and Osaka City Fire Bureau was carried out. (From 15:10 till 16:00 March 22nd)
- Lighting was recovered in the Central Operation Room. (22:43 March 22nd)
- Seawater injection of 35t to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 11:03 till 13:20 March 23rd) Around 120t of seawater was injected. (From around 5:35 till around 16:05 March 24th)
- Slightly blackish smoke generated from the reactor building. (Around 16:20 March 23rd) At around 23:30 March 23rd and around 4:50 March 24th, it was reported that the smoke seemed to cease.
- As the results of the survey of the stagnant water, into which workers who were laying electric cable on the ground floor and the basement floor of the turbine building of the Unit 3 walked, the dose rate on the water surface was around 400mSv/h, and as the result of gamma-ray analysis of the sampling water, the totaled concentration of each nuclide of the sampling water was around 3.9×10^{6} Bq/cm^{3}.
- Water spray by Kawasaki City Fire Bureau supported by Tokyo Fire Department was carried out. (From 13:28 till 16:00 March 25th)
- Fresh water injection to RPV was started. (18:02 March 25th)

- Water spray of around 100t using Concrete Pump Truck (50t/h) was carried out. (From 12:34 till 14:36 March 27th)
- In order to prepare to transfer the stagnant water on the basement floor of the turbine building to the Condenser, the water in the Condensate Storage Tank is being transferred to the Surge Tank of Suppression Pool Water. (From 17:40 March 28th till around 8:40 March 31st)
- The pump for the fresh water injection to RPV was switched from the Fire Pump Truck to the temporary motor-driven pump. (20:30 March 28th)
- Fresh water spray of around 100t using Concrete Pump Truck (50t/h) was carried out. (From 14:17 till 18:18 March 29th)
- Fresh water spray of around 105t using Concrete Pump Truck (50t/h) was carried out. (From 16:30 till 19:33 March 31st)
- Fresh water spray of around 75t using Concrete Pump Truck (50t/h) was carried out. (From 09:52 till 12:54 April 2nd)
- Lighting in the turbine building was partially turned on. (April 2nd)
- The camera for monitoring the water level in the vertical part of the trench outside of the turbine building was installed. (April 2nd)
- In order to switch the power supply to the motor-driven pump injecting fresh water to RPV from the temporary power supply to the external power supply, the injection to the reactor was temporarily carried out using the Fire Pump Truck. (From 10:03 till 12:16 April 3rd)
- The power supply for the fresh water injection to RPV was switched to the external power supply. (12:18 April 3rd)
- Fresh water spray of around 70t using Concrete Pump Truck (50t/h) was carried out. (From 17:03 till 19:19 April 4th)
- Fresh water spray (Around 70t) using Concrete Pump Truck (50t/h) was carried out. (From 06:53 till 08:53 April 7th)
- White smoke was confirmed to generate continuously (As of 06:30 April 7th)
- Fresh water injection to RPV is being carried out. (As of 15:30 April 7th)

<Unit 4>

- Because of the replacement work of the Shroud of RPV, no fuel was inside the RPV.
- The temperature of water in the Spent Fuel Pool had increased. (84 ℃

at 04:08 March 14th)

- It was confirmed that a part of wall in the operation area of Unit 4 was damaged. (06:14 March 15th)
- The fire at Unit 4 occurred. (09:38 March 15th) TEPCO reported that the fire was extinguished spontaneously. (11:00 March 15th)
- The fire occurred at Unit 4. (05:45 March 16th) TEPCO reported that no fire could be confirmed on the ground.(At around 06:15 March 16th)
- The Self-Defence Force started water spray over the Spent Fuel Pool of Unit 4 (09:43 March 20th).
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 4 by Self-Defense Force was started. (From around 18:30 till 19:46 March 20th).
- Water spray over the Spent Fuel Pool by Self-Defence Force using 13 fire engines was started (From 06:37 till 08:41 March 21st).
- Works for laying electric cable to the Power Center was completed. (At around 15:00 March 21st)
- Power Center received electricity. (10:35 March 22nd)
- Water spray of around 150t using Concrete Pump Truck (50t/h) was carried out. (From 17:17 till 20:32 March 22nd)
- Water spray of around 130t using Concrete Pump Truck (50t/h) was carried out. (From 10:00 till 13:02 March 23rd)
- Water spray of around 150t using Concrete Pump Truck (50t/h) was carried out. (From 14:36 till 17:30 March 24th)
- Water spray of around 150t using Concrete Pump Truck (50t/h) was carried out. (From 19:05 till 22:07 March 25th)
- Seawater injection to the Spent Fuel Pool via the Spent Fuel Pool Cooling Line was carried out. (From 06:05 till 10:20 March 25th)
- Water spray of around 125t using Concrete Pump Truck (50t/h) was carried out. (From 16:55 till 19:25 March 27th)
- Lighting of Central Operation Room was recovered. (11:50 March 29th)
- Fresh water spray of around 140t using Concrete Pump Truck (50t/h) was carried out. (From 14:04 till 18:33 March 30th)
- Fresh water spray of around 180t using Concrete Pump Truck (50t/h) was carried out. (From 08:28 till 14:14 April 1st)
- Lighting in the turbine building was partially turned on. (April 2nd)

- From 2 April, the stagnant water in the Main Building of Radioactive Waste Treatment Facilities was being transferred to the turbine building of Unit 4. As the water level in the vertical portion of the trench for Unit 3 rose from 3 April, by way of precaution, the transfer was suspended notwithstanding that the path of the water was not clear. (09:22 April 4th)
- Fresh water spray of around 180t using Concrete Pump Truck (50t/h) was carried out. (From 17:14 till 22:16 April 3rd)
- Fresh water spray 4 using Concrete Pump Truck (50t/h) was carried out. (From 17:35 till 18:22 April 5th)
- White smoke was confirmed to generate continuously. (As of 06:30 April 7th)

<Units 5 and 6>

- The first unit of Emergency Diesel Generator (D/G) (B) for Unit 6 is operating and supplying electricity. Water injection to RPV and the Spent Fuel Pool through the system of Make up Water Condensate (MUWC) is being carried out.
- The second unit of Emergency Diesel Generator (D/G) (A) for Unit 6 started up. (04:22 March 19th)
- The pumps for Residual Heat Removal (RHR) (C) for Unit 5 (05:00 March 19th) and RHR (B) for Unit 6 (22:14 March 19th) started up and recovered heat removal function. It cools Spent Fuel Pool with priority. (Power supply : Emergency Diesel Generator for Unit 6) (05:00 March 19th)
- Unit 5 under cold shut down (14:30 March 20th)
- Unit 6 under cold shut down (19:27 March 20th)
- Receiving electricity reached to the transformer of starter. (19:52 March 20th)
- Power supply to Unit 5 was switched from the Emergency Diesel Generator to external power supply. (11:36 March 21st)
- Power supply to Unit 6 was switched from the Emergency Diesel Generator to external power supply. (19:17 March 22nd)
- The temporary pump for RHR Seawater System (RHRS) of Unit 5 was automatically stopped when the power supply was switched from the temporary to the permanent. (17:24 March 23rd)

- Repair of the temporary pump for RHRS of Unit 5 was completed (16:14 March 24th) and cooling was started again. (16:35 March 24th)
- Power supply for the temporary pump for RHRS of Unit 6 was switched from the temporary to the permanent. (15:38 and 15:42 March 25th)
- The groundwater with low-level radioactivity in the Sub Drain Pit of Units 5 and 6 (Around 1,500t) was started to be discharged through the Water Discharge Canal to the sea. (21:00 April 4th)

<Common Spent Fuel Pool>

- It was confirmed that the water level of Spent Fuel Pool was maintained almost full at after 06:00 March 18th.
- Water spray over the Common Spent Fuel Pool was started. (From 10:37 till 15:30 March 21st)
- The power was started to be supplied (15:37 March 24th) and cooling was also started.(18:05 March 24th)
- As of 07:45 April 7th, water temperature of the pool was around 28℃.

<Other>

- As the result of nuclide analysis at around the Southern Water Discharge Canal, 7.4×10^{1}Bq/cm^3 of ^{131}I (Iodine) (1,850.5 times higher than the concentration limit in water outside the Environmental Monitoring Area) was detected. (14:30 March 26th)

  (As the result of measurement on 29 March, it was detected as 3,355.0 times higher than the limit in water (13:55 March 29th). On the other hand, as the result of the analysis at the northern side of the Water Discharge Canal of the NPS, 4.6×10^{1}Bq/cm^3 of ^{131}I (Iodine) (1,262.5 times higher than the limit in water) was detected. (14:10 March 29th)
- The water was confirmed to be collected in the vertical parts of the trenches (an underground structure for laying pipes, shaped like a tunnel) outside of the turbine building of Units 1 to 3. The dose rates on the water surface were 0.4 mSv/h of the Unit 1's trench and 1,000 mSv/h of the Unit 2's trench. The rate of the Unit 3's trench could not measure because of the rubble. (Around 15:30 March 27th) The collected water in the vertical part of the trench outside of the turbine building of Unit 1 was transferred to the storage tank in the Main Building of Radioactive Waste Treatment Facilities by the temporary pump. Thereafter the

water level from the top of the vertical part went down from approximately -0.14m to approximately -1.14m. (From 09:20 till 11:25 March 31st)

- In the samples of soil collected on 21 and 22 March on the site (at 5 points) of Fukushima Dai-ichi NPS, ^{238}P (Plutonium), ^{239}P (Plutonium) and ^{240}P (Plutonium) were detected (23:45 March 28th announced by TEPCO). The concentration of the detected plutonium was at the equivalent level of the fallout (radioactive fallout) that was observed in Japan concerning the past atmospheric nuclear testing, i.e. at the equivalent level of the normal condition of environment, and was not at the level of having harmful influence on human body.
- When removing the flange of pipes of Residual Heat Removal Seawater System outside the building of Unit 3, three subcontractor's employees were wetted by the water remaining in the pipe. However, as the result of wiping the water off, no radioactive materials were attached to their bodies. (12:03 March 29th)
- On March 28th, the stagnant water was confirmed in the Main Building of Radioactive Waste Treatment Facilities. As the result of analysis of radioactivity, the total amount of the radioactivity 1.2×10^{1} Bq/cm^3 in the controlled area and that of 2.2×10^{1} Bq/cm^3 in the non-controlled area were detected in March 29th.
- As the result of nuclide analysis at around the Southern Water Discharge Canal, 1.8×10^{2} Bq/cm^3 of ^{131}I (Iodine) (4,385.0 times higher than the concentration limit in water outside the Environmental Monitoring Area) was detected (13:55 March 30th).
- The barge (the first ship) of the US armed forces carrying fresh water for cooling reactors, etc. landed in the exclusive port of the power station, being towed by the ships of Maritime Self-Defense Force. (15:42 March 31st) The transfer of fresh water from the barge (the first ship) to the Filtrate Tank was started. (15:58 April 1st) Thereafter it was suspended due to the malfunction of the hose (16:25 April 1st), but was resumed on April 2nd. (From 10:20 till 16:40 April 2nd)
- The permanent monitoring posts (No.1 to 8) installed near the Site Boundary were recovered. (March 31st) They are measuring once a day.
- The spraying for test scattering of antiscattering agent was carried out in the area of about 500 m^2 on the mountain-side of the Common Pool.

(From 15:00 till 16:05 April 1st)

- The barge (the second ship) of the US armed forces carrying fresh water for cooling reactors, etc. landed in the exclusive port of the power station, being towed by the ships of Maritime Self-Defense Force. (9:10 April 2nd)
- The freshwater was transferred from the barge (the second ship) of the US armed force to the barge (the first ship). (From 09:52 till 11:15 April 3rd)
- The stagnant water with low-level radioactivity in the Main Building of Radioactive Waste Treatment Facilities was started to be discharged from the southern side of the Water Discharge Canal to the sea, using the first pump. (19:03 April 4th) Further, the discharge using 10 pumps in total was carried out. (19:07 April 4th)
- In the samples of soil (7 samples in total) collected on 25 March (at 4 points) and 28 March (at 3 points) on the site of Fukushima Dai-ichi NPS, ^{238}P (Plutonium), ^{239}P (Plutonium) and ^{240}P (Plutonium) were detected (18:30 April 6th announced by TEPCO). The concentration of the detected plutonium was, in the same as the last one (Announced on 28 March), at the equivalent level of the fallout (radioactive fallout) that was observed in Japan concerning the past atmospheric nuclear testing, i.e. at the equivalent level of the normal condition of environment, and was not at the level of having harmful influence on human body.
- In order to prevent the contaminated water from outflowing from the exclusive port, the work for stopping water by means of large-sized sandbags was implemented around the seawall on the south side of the NPS. (From 15:00 till 16:30 April 5th)
- The test scattering of antiscattering agent to prevent the radioactive materials on the ground surface from being scattered was carried out in the area of about 600 m^2 on the mountain-side of the Common Pool. (April 5th, 6th)

● Fukushima Dai-ni NPS (TEPCO)

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

(1) The state of operation

Unit1 (1,100MWe): automatic shutdown, cold shut down at 17:00, March 14th

Unit2 (1,100MWe): automatic shutdown, cold shut down at 18:00,

March 14th
Unit3 (1,100MWe): automatic shutdown, cold shut down at 12:15, March 12th
Unit4 (1,100MWe): automatic shutdown, cold shut down at 07:15, March 15th

(2) Major plant parameters (As of 12:00 April 7th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.14	0.10	0.17
Reactor water temperature	℃	25.3	25.5	35.8	30.3
Reactor water level*2	mm	9,346	10,346	7,817	8,785
Suppression pool water temperature	℃	23	24	26	31
Suppression pool pressure	kPa (abs)	105	103	111	111
Remarks		cold shutdown	cold shutdown	cold shutdown	cold shutdown

*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 30th, 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 stopped to generate. 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 Residual Heat Removal System (B) to cool the reactor of Unit 1 became to be able to receive power from the emergency power supply as well as the external power supply. This resulted in securing the backup power supplies (emergency power supplies) of Residual Heat Removal System (B) for all Units. (14:30 March 30th)

(4) Report concerning other incidents

- TEPCO reported to NISA the event in accordance with the Article 10 of

the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 1. (18:08 March 11th)

- TEPCO reported to NISA the events in accordance with the Article 10 regarding Units 1, 2 and 4. (18:33 March 11th)
- TEPCO reported to NISA the event (Loss of pressure suppression functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 1. (5:22 March 12th)
- TEPCO reported to NISA the event (Loss of pressure suppression functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 2. (5:32 March 12th)
- TEPCO reported to NISA the event (Loss of pressure suppression function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 4 of Fukushima Dai-ni NPS. (6:07 March 12th)
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● Onagawa NPS (Tohoku Electric Power Co. Inc.)
(Onagawa Town, Oga County and Ishinomaki City, Miyagi Prefecture)

(1) The state of operation

Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12th
Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake
Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12th

(2) Readings of monitoring post, etc.

MP2 (Monitoring at the Northern End of Site Boundary)
Approx. 0.37 μ SV/h (16:00 April 7th) (Approx. 0.38 μ SV/h (16:00 April 6th))

(3) Report concerning other incidents

- Fire Smoke on the first basement of the Turbine Building was confirmed to be extinguished. (22:55 on March 11th)
- Tohoku Electric Power Co. reported to NISA in accordance with the

Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:09 March 13th)

2. Action taken by NISA

(March 11th)

14:46 Set up of the NISA Emergency Preparedness Headquarters (Tokyo) immediately after the earthquake

15:42 TEPCO reported to NISA in accordance with the 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) in accordance with the 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-ni NPS, TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

18:33 Regarding Units 1, 2 and 4 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the 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 a direction for the residents within 2 km radius from Unit 1 of Fukushima Dai-ichi NPS to evacuate. (The population of this area is 1,864.)

21:23 Directives 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 occurred at Fukushima Dai-ichi NPS, TEPCO, in accordance with the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

- Direction for the residents within 3km radius from Unit 1 of

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

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

(March12th)

0:49 Regarding Units 1 TEPCO Fukushima Dai-ichi NPS, TEPCO recognized the event (Unusual rise of the pressure in PCV) in accordance with the 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-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the 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-ni NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

05:44 Residents within 10km radius from Unit 1 of Fukushima Dai-ichi NPS shall evacuate by the Prime Minister Directive.

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

06:50 In accordance with the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to control the internal pressure of PCV of Units 1 and 2 of Fukushima Dai-ichi NPS.

07:45 Directives from the Prime Minister to the Governor of Fukushima Prefecture, the Mayors of Hirono Town, Naraha Town , Tomioka Town and Okuma Town were issued regarding the event occurred at Fukushima Dai-ni NPS, TEPCO, pursuant to the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:
- Direction for the residents within 3km radius from Fukushima

Dai-ni NPS to evacuate

- Direction for the residents within 10km radius from Fukushima Dai-ni NPS to stay in-house

17:00 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

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

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

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

20:05 Considering the Directives from the Prime Minister and pursuant to the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to inject seawater to 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 13th)

05:38 TEPCO reported to NISA the event (Total loss of coolant injection function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 3 of Fukushima Dai-ichi NPS. Recovering efforts by TEPCO of the power source and coolant injection function and the work on venting were under way.

09:01 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the 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 Directive was issued for the Governor of Fukushima Prefecture, the Mayors of Okuma Town, Futaba Town, Tomioka Town and Namie

Town in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness on the contents of radioactivity decontamination screening.

13:09 Tohoku Electric Power Co. reported to NISA that Onagawa NPS reached a situation specified in the 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 14th)

01:10 Seawater injection for Units 1 and 3 of Fukushima Dai-ichi NPS were temporarily interrupted due to the lack of seawater in pit.

03:20 Seawater injection for Unit 3 of Fukushima Dai-ichi NPS was restarted.

04:40 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the 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 the 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 PCV) falling under the 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) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

22:13 TEPCO reported to NISA in accordance with the 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 15th)

00:00: The acceptance of experts from International Atomic Energy Agency (IAEA) was decided. NISA agreed to accept the offer of dispatching of the expert on NPS damage 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 the acceptance of 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

07:24 Incorporated Administration Agency, Japan Atomic Energy Agency (JAEA) reported to NISA in accordance with the 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 in accordance with the 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

10:30 According to the Nuclear Regulation Act, the Minister of Economy, Trade and Industry issued the directions as follows.

For Unit 4: To extinguish fire and to prevent the occurrence of re-criticality

For Unit 2: To inject water to reactor vessel promptly and to vent

Drywell.

10:59 Considering the possibility of lingering situation, it was decided that the function of the Local Nuclear Emergency Response Headquarters was moved to the Fukushima Prefectural Office.

11:00 The Prime Minister directed the in-house stay area.
In-house stay was additionally directed to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS considering in-reactor situation.

16:30 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

22:00 According to the Nuclear Regulation Act, the Minister of Economy, Trade and Industry issued the following direction.
For Unit 4: To implement the water injection to the Spent Fuel Pool.

23:46 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 18th)

13:00 Ministry of Education, Culture, Sports, Science and Technology decided to reinforce the nation-wide monitoring survey in the emergency of Fukushima Dai-ichi and Dai-ni NPS.

15:55 TEPCO reported to NISA on the accidents and failure 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 area of radiation) pursuant to the 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) pursuant to the Article 62-3 of the Nuclear Regulation Act.

(March 19th)

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

TEPCO reported to NISA that the pump for RHR (C) for Unit 5 started up and started to cooling 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 the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 20th)

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

(March 21st)

07:45 Directive titled as "Administration of the stable Iodine" was issued from Local Nuclear Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs 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 on personal judgements.

16:45 Directive titled as "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 and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs 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 Directive from the Director-general of the Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi and Gunma was issued, which direct 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 22nd)

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

(March 25th)

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

(March 28th)

Regarding the mistake in the evaluation of the concentration measurement in the stagnant water on the basement floor of the turbine building of Unit 2 of Fukushima Dai-ichi NPS 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) (Stagnant 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 accomplish the communication in the company on significant information in a

timely manner and to report it in a timely and appropriate manner.

(March 29th)

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 the Article 62-3 of the Nuclear Regulation Act and the 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 "Team to Assist the Lives of the Nuclear Accident Sufferers" 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 20 km to 30 km radius.

(March 30th)

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 was issued and handed to each electric power company and the relevant organization.

(March 31st)

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 taking the carefully though-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 20 km to 30 km radius.

(April 1st)

NISA strictly alerted TEPCO to taking appropriate measures concerning the following three matters regarding the mistake in the result of 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 the 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 2nd)

Regarding the outflow of the liquid including 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 the Unit 2, and to strengthen monitoring through sampling water at more points around the facilities concerned.

(April 4th)

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 5th)

Directions 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, was issued.

(April 6th)

On the implementation of the nitrogen injection to PCV of Unit 1, NISA directed TEPCO on the following three points. (12:40 April 6th) ① Properly control the plant parameters and take measures appropriately to ensure safety in response to changes in the parameters. ②Establish and implement an organizational structure and so on that will ensure the safety of the workers who will engage in the operation. ③As the possibility of leakage of the air in 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.

< Possibility on radiation exposure (As of 08:00 April 7th) >

1. Exposure of residents

(1) Including the 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 13,000 cpm 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 12th to 15th. 162 people received examination until now. At the beginning, the reference value was set at 6,000 cpm. 110 people were at the level below 6,000 cpm and 41 people were at the level of 6,000 cpm or more. When the reference value was increased to 13,000 cpm afterward, 8 people were at the level below 13,000 cpm and 3 people are at the level of 13,000 cpm or more.

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

(5) The 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 13 March. It is carried out by rotating the evacuation sites and at the 13 places (set up permanently) such as health offices. Up until April 5th, the screening was done to 131,604 people. Among them, 102 people were above the 100,000 cpm, but when measured these people again without clothes, etc., the counts decreased to 100,000 cpm and below, and there was no case which affects health.

2. Exposure of workers

As for the workers conducting operations in Fukushima Dai-ichi NPS, the total number of people who were at the level of exposure more than 100 mSv becomes 21.

For two out of the three workers who were confirmed to be at the level of exposure more than 170 mSv 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 25th, 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 3 Sv. 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.

At around 11:35 April 1st, a worker fell into the sea when he went on board the barge of the US Armed forces 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 existence of internal radionuclide contaminant is being confirmed by a whole-body counter.

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 17th. 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 24th, 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 at not at the level of having harmful influence.

(4) From March 26th to 27th, 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 28th to 30th, 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 Iidate Village Office. The result was not at the level of having harmful influence.

<Directive of screening levels for decontamination of radioactivity>

(1) On March 20th, the Local Nuclear Emergency Response Headquarters issued the directive to change the reference value for the screening level for decontamination of radioactivity as the following to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village).

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

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

<Directives of administrating stable Iodine during evacuation>

(1) On March 16th, the Local Nuclear Emergency Response Headquarters issued "Directive to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village).

(2) On March 21st, the Local Nuclear Emergency Response Headquarters issued Directive titled as "Administration of the stable Iodine" to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs the above-mentioned governor and heads to administer stable Iodine under the direction of the headquarters and in the presence of medical experts, and not to administer it on personal judgements.

<Situation of the injured (As of 08:00 April 7th)>

1. Injury in Unit 1 of Fukushima Dai-ichi NPS due to earthquake on 11 March
   - Two employees (slightly, have already gone back working)
   - Two subcontract employees (one 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 30th, the two employees were found on the basement floor of the turbine building of Unit 4 and were confirmed dead by April 2nd.)

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 return to work.)
   - Three subcontractor employees (They have already return 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 17th.)

4. Other injuries
   - On the earthquake on 11 March, 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.)
   - 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 22 and 23 March. (One employee has already returned to work and the other is under home treatment.)

- One emergency patient on 12 March. (Cerebral infarction, 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)
- 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 13 March. (One employee has already returned to work and the other is under home treatment.)

<Situation of resident evacuation (As of 08:00 April 6th)>

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

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

- The in-house stay in the area from 20 km to 30 km 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 are implemented.
- On March 28th, Chief Cabinet Secretary mentioned the continuation of the limited-access within the area of 20 km 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 20 km zone.

<Directives regarding foods and drinks>

Directive from the Director-General of the Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi, Gunma, and Chiba was issued, which directed

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 April 6th)

Prefectures	Suspension of shipment	Restriction of intake
Fukushima Prefecture	Non-head type leafy vegetables, head type leafy vegetables , flowerhead brassicas (Spinach, Cabbage, Broccoli, Cauliflower, *Komatsuna**, *Kukitachina**, *Shinobufuyuna**, Rape, *Chijirena, Santouna*, Kousaitai*, Kakina*, etc.*), Turnip, Raw milk	Non-head type leafy vegetables, head type leafy vegetables, flowerhead brassicas (Spinach, Cabbage, Broccoli, Cauliflower, *Komatsuna**, *Kukitachina**, *Shinobufuyuna,* Rape, *Chijirena, Santouna*, Kousaitai*, Kakina*, etc.*)
Ibaraki	Spinach, *Kakina**, Parsley,	

Pref.	Raw milk	
Tochigi Pref.	Spinach, *Kakina**	
Gunma Pref.	Spinach, *Kakina**	
Chiba Pref.	- Spinach from Katori City and Tako Town - Spinach, Qing-geng-cai, Garland chrysanthemum, Sanchu Asian lettuce, Celery and Parsley from Asahi City	

*a green vegetable

(2) Request for restriction of drinking for tap-water (As of 08:00 April 6th)

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

<Directive regarding the ventilation when using heating equipments in the aria of indoor evacuation >

On March 21st, Directive titled as "Ventilation for using heating equipments within the in-house evacuation zone" from the Director-General of Local Nuclear Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City

and Iidate Village) was issued, which directs those 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.

< Fire Bureaus' Activities>

- From 11:00 till around 14:00 on March 22nd, 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 23rd, Niigata City Fire Bureau and Hamamatsu City Fire Bureau gave guidance to TEPCO as to the operation of large decontamination system.

(Contact Person)
Mr. Toshihiro Bannai
Director, International Affairs Office,
NISA/METI
Phone:+81-(0)3-3501-1087

From: Berry, Rollie
Sent: Thursday, April 07, 2011 11:50 PM
To: RST01 Hoc; Alter, Peter; Hasselberg, Rick
Subject: Watchbill

Follow Up Flag: Follow up
Flag Status: Flagged

Rick and Peter,
If the watchbill gets extended, I would like to have either mids or swings (don't care, just would like a constant time) mon-thurs as either the communicator or coordinator.

Thanks,
Rollie

aaa/267

From: ET02 Hoc
Sent: Friday, April 08, 2011 10:43 AM
To: Giessner, John; Kammerer, Annie
Cc: LIA02 Hoc; LIA03 Hoc
Subject: OUTLOOK MAILBOX

I'm not sure if OIS has contacted your or not so I thought I would let you know that we (Executive Support Team in the Operations Center) received a report today regarding the status of mailboxes being used by responders to the Japanese event. According to the report John's mailbox is at 89.5% capacity and Annie's mailbox is at 82% capacity. If you could take a few minutes to archive your mailbox that would be great. The CSC is open 24/7 so if you need assistance in archiving your mailbox, please call them (301-415-1234). Thanks very much...Karen Jackson, Response Ops System Manager

QQQ | 268

From: CDC IMS Chief Science/Health -2 <eocchs2@cdc.gov>
Sent: Friday, April 08, 2011 12:43 PM
To: Keith, Sam (ATSDR/DTEM/ATB); PMT10 Hoc
Cc: CDC IMS Scientific Response Section Chief -2; CDC IMS Scientific Response Section Task Tracker -2; CDC IMS Chief Science/Health -2; Smith, James M. (CDC/ONDIEH/NCEH) (CTR); Whitcomb, Robert C. (CDC/ONDIEH/NCEH); Wood, Charles (CDC/ONDIEH/NCEH) (CTR)
Subject: RE: Some of today's focus areas at NRC EOC - Official Use Only

Sam,

Do you have the NRC document to send yet?

Thanks,

Bob

From: 2011 Japan Earthquake (CDC)
Sent: Friday, April 08, 2011 10:59 AM
To: CDC IMS Associate Director for Science -2; CDC IMS Scientific Response Section Chief -2; CDC IMS Scientific Response Section Task Tracker -2; CDC IMS Chief Science/Health -2; CDC IMS Chief of Staff -2
Cc: 2011 Japan Earthquake (CDC)
Subject: Some of today's focus areas at NRC EOC - Official Use Only

FYSA. Forwarded per IM direction.

Patrick Ludford
CDC 2011 Japan Response Coordinator
eocevent49@cdc.gov
404-553-7746

From: Keith, Sam (ATSDR/DTEM/ATB)
Sent: Friday, April 08, 2011 10:19 AM
To: EOC Report (CDC)
Subject: FW: Some of today's focus areas at NRC EOC - Official Use Only

As requested by RADM Deitchman

From: Keith, Sam (ATSDR/DTEM/ATB)
Sent: Friday, April 08, 2011 10:03 AM
To: CDC IMS Scientific Response Section Chief -2
Cc: Whitcomb, Robert C. (CDC/ONDIEH/NCEH); Evans, Lynn (CDC/ONDIEH/NCEH); Charp, Paul (ATSDR/DHAC/SRAB)
Subject: Some of today's focus areas at NRC EOC - Official Use Only

Folks, based on this morning's meeting at NRC EOC:

NRC continues as the lead in Japan on reactor matters.
No change in reactor plant status.

0002/269

Priority documents/evaluations under development:
-Grab and go temporary reentry into evacuation zones
-Permanent relaxation of evacuation zone
-Reentry into Tokyo
-Reactor stability
-Reactor safety reassessment
-Low power criticality in spent fuel pool assessment
-PAR differences
-Slurry in spent fuel pool assessment

Sam Keith
CDC Liaison to NRC

From: LIA08 Hoc
Sent: Friday, April 08, 2011 1:25 PM
To: PMT10 Hoc
Subject: FW: Security clearance confirmation

For your info. Jeff

From: Kerben, Valerie
Sent: Friday, April 08, 2011 1:24 PM
To: LIA08 Hoc
Subject: RE: Security clearance confirmation

Jeff
We did receive the verification from his agency on 4/4 and it is in our system for the guards to issue a TS - Q badge.

Valerie B. Kerben
Chief, Personnel Security Branch
Division of Facilities and Security
U.S. Nuclear Regulatory Commission
(office#) 301-492-3527
(fax #) 301-492-3442

From: LIA08 Hoc
Sent: Friday, April 08, 2011 1:06 PM
To: Kerben, Valerie
Subject: FW: Security clearance confirmation

Valerie...can you check on Sams security clearance from CDC?

Thanks

Jeff Temple
Liaison Team Coordinator
301-816-5185

From: PMT10 Hoc
Sent: Friday, April 08, 2011 1:04 PM
To: LIA08 Hoc
Subject: Security clearance confirmation

Jeff,

000270

I would appreciate you seeing if my DHHS TS security clearance has been received by NRC. My relevant information is Larry Samuel Keith, DOB 08/05/1950.

Also, a basic reason I am here is to learn of NRC activities and products that can help CDC in their task of protecting public health here and in Japan. All of the work with which I have been engaged while in the NRC EOC is in line with a "need to know" for this type information. I would appreciate confirmation from the Liaison Director that I am authorized to fully interface with the various groups here. That was my understanding upon inbriefing, but want to make sure this still meets NRC needs.

Thanks,
Sam Keith
CDC Liaison