Cronk, Kevin

From: LIA07 Hoc
Sent: Wednesday, April 06, 2011 6:12 PM
To: Liaison Japan
Subject: OUO -- Status Update - 1800 EDT, April 6, 2011
Attachments: USNRC Earthquake-Tsunami Update.040611.1800EDT.docx

Attached is the latest Status Update.
Please let me know if you have any changes for the next issue (0430 EDT, April 7).
Thanks!
-Sara

JJJ|270

From: Casto, Chuck
To: Weber, Michael; Batkin, Joshua; Hayden, Elizabeth
Cc: Loyd, Susan; McIntyre, David; Brenner, Eliot; Harrington, Holly; Couret, Ivonne; Janbergs, Holly; Burnell, Scott; Virgilio, Martin; Collins, Elmo; Johnson, Michael
Subject: Re: RESPONSE - Quick statement on RST 3/26 assessment report
Date: Wednesday, April 06, 2011 9:58:44 AM

For what it's worth, I am good with mike's statement.

From: Weber, Michael
To: Batkin, Joshua; Hayden, Elizabeth
Cc: Loyd, Susan; McIntyre, David; Brenner, Eliot; Harrington, Holly; Couret, Ivonne; Janbergs, Holly; Burnell, Scott; Virgilio, Martin; Casto, Chuck; Collins, Elmo; Johnson, Michael
Sent: Wed Apr 06 09:54:21 2011
Subject: RESPONSE - Quick statement on RST 3/26 assessment report

I would suggest we use something like the following, which I modified from OPA's draft below:

The March 26 document represented an interim snapshot of what NRC staff and other experts considered ~~proposed~~ as possible conditions inside the damaged units at Fukushima-Daiichi. Based on these conditions, ~~This snapshot changed over the next few days as additional information and analysis became available. The~~ the NRC staff's recommendations are considered prudent measures; they are not offered as the only possible solutions. We understand that the Japanese operator and regulator of the plants is pursuing an alternative set of strategies to control the plants and ensure the safety of the people working at the plants and living nearby. We are working with our counterparts to consider these strategies and explore additional steps that could enhance safety. ~~Conditions at the site have improved even further since the assessment was completed, so it is inappropriate to treat the March 26 document as the current understanding of the situation.~~

Clean text reads:

The March 26 document represented an interim snapshot of what NRC staff and other experts considered as possible conditions inside the damaged units at Fukushima-Daiichi. Based on these conditions, the NRC staff's recommendations are considered prudent measures; they are not offered as the only possible solutions. We understand that the Japanese operator and regulator of the plants is pursuing an alternative set of strategies to control the plants and ensure the safety of the people working at the plants and living nearby. We are working with our counterparts to consider these strategies and explore additional steps that could enhance safety.

From: Batkin, Joshua
Sent: Wednesday, April 06, 2011 9:29 AM
To: Hayden, Elizabeth; Virgilio, Martin; Weber, Michael
Cc: Loyd, Susan; McIntyre, David; Brenner, Eliot; Harrington, Holly; Couret, Ivonne; Janbergs, Holly; Burnell, Scott
Subject: Re: Quick statement on RST 3/26 assessment report

JJJ\271

Mike/Marty, is that overly optimistic sounding or is it OK?

Joshua C. Batkin
Chief of Staff
Chairman Gregory B. Jaczko
(301) 415-1820

From: Hayden, Elizabeth
To: Batkin, Joshua; Virgilio, Martin; Weber, Michael
Cc: Loyd, Susan; McIntyre, David; Brenner, Eliot; Harrington, Holly; Couret, Ivonne; Janbergs, Holly; Burnell, Scott
Sent: Wed Apr 06 09:23:21 2011
Subject: FW: Quick statement on RST 3/26 assessment report

This is what we plan to say with regard to the NYT story this morning. It is OK with the ET in the Ops Center. We have a slew of reporters asking for the report and as far as I know, it is releasable under a FOIA request.

Beth Hayden

From: Burnell, Scott

The March 26 document represented an interim snapshot of what NRC staff and other experts proposed as possible conditions inside the damaged units at Fukushima. This snapshot changed over the next few days as additional information and analysis became available. The staff's recommendations are considered prudent measures; they are not offered as the only possible solutions. Conditions at the site have improved even further since the assessment was completed, so it is inappropriate to treat the March 26 document as the current understanding of the situation.

Powerful Aftershock Complicates Japan's Nuclear Efforts

David Guttenfelder/Associated Press

Police, wearing anti-radiation suits, searched for victims inside the deserted evacuation zone around the Fukushima Daiichi nuclear reactors in Minami Soma, Japan, on Thursday.

By HIROKO TABUCHI and ANDREW POLLACK
Published: April 7, 2011

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TOKYO — The strongest aftershock to hit since the day of the March 11 earthquake and tsunami in Japan rocked a wide section of the country's northeast Thursday night, prompting a tsunami alert, raising fears of further damage to the already crippled Fukushima Daiichi nuclear plant and knocking out external power at three other nuclear facilities.

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Problems With Radioactive Water at the Plant

The public broadcaster, NHK, said there were local reports of injuries, fires and blackouts. The aftershock had a magnitude of 7.1, according to the United States Geological Survey; last month's quake, which devastated much of the northeastern coast, was measured at 9.0.

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The tsunami alert, which warned of waves up to three feet and possibly higher in some areas, was lifted after about an hour and a half and Japan's Meteorological Agency said no tsunami had been detected.

But it warned that slight changes in sea level were still possible and it was unclear whether there was any damage along the coast. Many coastal communities were ravaged last month, and some are vulnerable because sea walls were breached and land levels have sunk.

Workers at the Fukushima plant were told to take cover until the tsunami warning was lifted, but Japanese officials said at a news conference that water was being automatically pumped into three damaged reactors in the crucial effort to keep their nuclear fuel cool. The plant's cooling systems were knocked out by last month's quake and tsunami, and there was no immediate word of whether there was new damage to the plant, according to its operator, the Tokyo Electric Power Company.

Nitrogen also continued to be piped into the No. 1 reactor, the company said, in an effort to prevent a possible explosion. Tokyo Electric said it was unsure of the status of the damaged No. 4 reactor because it has not been able to station workers there.

Monitoring posts around the plant were not showing any rise in radiation levels, the company said.

Experts have said that a big aftershock poses an additional risk to the Fukushima plant because its containment structures are filled with water that was used in the cooling efforts and is now highly radioactive. The strain from holding that water could make the structures more vulnerable to rupture in the event of an earthquake, according to an assessment made by the United States Nuclear Regulatory Commission in late March.

Two other nuclear facilities — a fuel reprocessing plant at Rokkasho and a nuclear power plant at Higashidori, both in northern Aomori Prefecture — were running on emergency diesel generators after their external power supplies were knocked out by the aftershock.

A third site, the Onagawa nuclear power station in Miyagi Prefecture, lost two of its three external power systems. All three facilities have been shut down since the March 11 quake, but power is needed to keep the nuclear fuel cool.

The aftershock hit at 11:32 p.m. local time and was centered 41 miles east of Sendai, 72 miles from Fukushima and 205 miles from Tokyo, officials said. It was about 30 miles below the ocean floor, considerably deeper than March 11's

Interactive Graphic

Status of the Nuclear Reactors at the Fukushima Daiichi Power Plant

Graphic

Assessing the Radiation Danger, Near and Far

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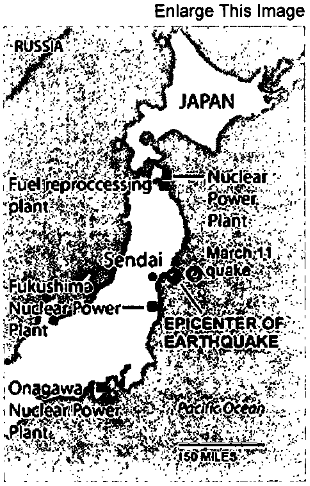

The New York Times

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magnitude 9.0 quake, which hit about 20 miles below the sea floor.

Thursday's aftershock was the strongest since the day of the March 11 quake, according to the United States Geological Survey. There have been hundreds of aftershocks since the initial quake.

Also on Thursday, the police searched for people missing in an evacuation zone around the Fukushima Daiichi plant.

Nearly 240 police officers from Tokyo and about 100 from Fukushima Prefecture fanned out wearing protective suits in a search for bodies in the 12-mile evacuation zone around the plant, according to Mikio Murakoshi, a spokesman for the Fukushima Prefecture police.

Japanese and American soldiers last weekend conducted a huge search for the missing but avoided the evacuation zone because of the radiation risk. But Mr. Murakoshi said radiation levels had dropped, making a search in the area possible.

The police say about 12,600 people have died as a result of the March 11 earthquake and tsunami. More than 14,700 are listed as missing, including about 4,200 in the evacuation zone around the Fukushima plant.

The magnitude 9.0 quake and tsunami flattened communities, has kept an estimated 160,000 still housed in temporary shelters and knocked out power at the Fukushima Daiichi plant, where workers have since battled to stabilize the reactors.

Raising new concerns about the plant, the United States Nuclear Regulatory Commission said that some of the core of the No. 2 reactor had probably leaked from its steel pressure vessel into the bottom of the containment structure. The assessment implied that the damage at the No. 2 unit was worse than previously believed.

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Keith Bradsher contributed reporting from Hong Kong.

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Powerful Aftershock Complicates Japan's Nuclear Efforts

Published: April 7, 2011

(Page 2 of 2)

The agency emphasized its interpretation was speculative and based on high radiation readings that Tokyo Electric had found in the lower part of unit No. 2's primary containment structure, called the drywell. The statement said that the commission "does not believe that the reactor vessel has given way, and we do believe practically all of the core remains in the vessel."

Linda L. Gunter, a spokeswoman for Tokyo Electric, dismissed the analysis, saying Thursday morning, "We believe the containment for the reactor is still functioning at Unit 2; however, the damage to the suppression pool may be the source of the radiation."

But a spokesman for the Nuclear and Industrial Safety Agency of Japan said that he was familiar with the Nuclear Regulatory Commission's statement and agreed that it was possible the core had leaked into the larger containment vessel.

The statement was issued after Representative Edward J. Markey, Democrat of Massachusetts, told a House hearing on Wednesday morning that the commission had told him that the core had melted through the vessel.

He based that on a question his staff had asked the agency. But the agency responded to him by e-mail on Tuesday without directly addressing possible melting, saying only that it speculated that "part of the Unit 2 core may be out of the reactor pressure vessel and may be in the lower space of the drywell." After the hearing, in response to numerous questions, the agency said that "there are possible leakage paths from the reactor vessel into the drywell."

Multimedia

Graphic

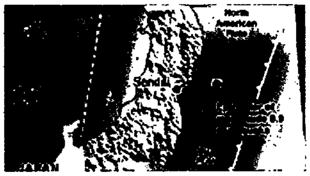
Problems With Radioactive Water at the Plant

Interactive Graphic

Status of the Nuclear Reactors at the Fukushima Daiichi Power Plant

Graphic

Assessing the Radiation Danger, Near and Far



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It did not say whether the fuel was molten or solid. If molten fuel has left the reactor's pressure vessel and reached the drywell in substantial quantities, it raises the possibility that the fuel could escape the larger containment structure, leading to a large-scale radioactive release.

Some engineers have theorized that if a core melted down and concentrated at the bottom of the vessel it could melt through the vessel and then burn through the concrete of the foundation. One element of such an event would probably be a resumption of the nuclear chain reaction, in a molten mass in which no control would be possible because there would be no control rods to slide smoothly between neatly arrayed bundles of fuel.

Other experts say that a resumption of the chain reaction would be difficult or impossible with the type of fuel in use at Fukushima Daiichi.

But extremely radioactive material continues to ooze out of the reactor pressure vessel at Reactor 2, and the leak is likely to widen with time, a senior nuclear executive said.

"It's a little like pulling a thread out of your tie," he said. "Any breach gets bigger."

Flashes of extremely intense radioactivity have become a serious problem, he said. Tokyo Electric's difficulties in providing accurate information on radiation are not a result of software problems, as some Japanese officials have suggested, but stem from radiation damaging measurement instruments because it exceeds the maximum dose that they are designed to measure, he said.

"It's killing the measuring equipment," he said. "They're blaming it on software — it's their meters getting cooked."

Broken pieces of fuel rods have been found outside of Reactor 2, and are now being covered with bulldozers, he said. The broken pieces may be from spent fuel rods in the spent-fuel pools, as opposed to the reactors themselves. Hydrogen explosions have flung them out of the reactor building.

"They're running bulldozers around to bury the stuff so it doesn't cook people going by," he said.

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Keith Bradsher contributed reporting from Hong Kong.

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In the Suburbs, a Constancy of Change

Droggitis, Spiros

From: Decker, David
Sent: Thursday, April 07, 2011 1:47 PM
To: OCA Distribution
Subject: FW: URGENT:NISA Press Release issued at 23:50, Thursday, 0:35 and 1:00, Friday

This just in -- below is the is latest we have here at the Ops Center. This is a summary of recent NISA press releases from NRC staff in Japan (at 1:45am!). Hard to sleep through a 7.1 earthquake, I guess!

From: LIA08 Hoc
Sent: Thursday, April 07, 2011 1:44 PM
To: Decker, David
Subject: FW: URGENT:NISA Press Release issued at 23:50, Thursday, 0:35 and 1:00, Friday

From: LIA02 Hoc
Sent: Thursday, April 07, 2011 1:37 PM
To: LIA08 Hoc; ET07 Hoc; LIA06 Hoc; RST01 Hoc; Hoc, PMT12; PMT02 Hoc
Subject: FW: URGENT:NISA Press Release issued at 23:50, Thursday, 0:35 and 1:00, Friday

From: Emche, Danielle
Sent: Thursday, April 07, 2011 1:21 PM
To: LIA02 Hoc
Subject: Fw: URGENT:NISA Press Release issued at 23:50, Thursday, 0:35 and 1:00, Friday

Summary of power to nuclear facilities
Danielle
Sent from an NRC BlackBerry.

From: PROTOCOLOFFICE-EM <protocoloffice-em@mofa.go.jp>
To: PROTOCOLOFFICE-EM <protocoloffice-em@mofa.go.jp>
Sent: Thu Apr 07 13:05:35 2011
Subject: URGENT:NISA Press Release issued at 23:50, Thursday, 0:35 and 1:00, Friday

URGENT
(1:45) Friday, 8 April 2011

To All Missions (Embassies, Consular posts and International Organizations in Japan)

According to the NISA press release issued at 23:50, 0:35 and 1:00:

- The spent fuel reprocessing plant at Rokkasho-mura, Aomori Prefecture is in test operation and the uranium enrichment plant is NOT IN OPERATION. The Higashi-dori (Aomori Prefecture), Onagawa (Miyagi Prefecture), Fukushima Dai-ichi and Fukushima Dai-ni nuclear power plants are NOT IN OPERATION after the Tohoku-Pacific earthquake of March 11. Tokai Dai-ni nuclear power plant (Ibaraki Prefecture) is NOT IN OPERATION.

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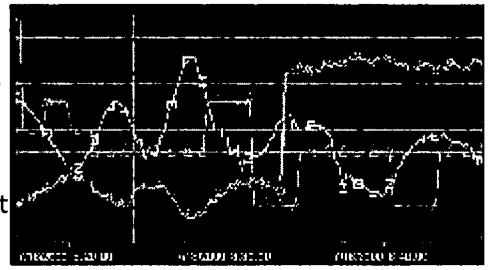
- The spent fuel reprocessing plant and the uranium enrichment plant at Rokkasho-mura keep power supply by the emergency diesel generator as the power supply from outside has been cut after the earthquake.
- The Higashi-dori nuclear power plant keeps power supply by the emergency diesel generator as the power supply from outside has been cut after the earthquake, and the cooling of the spent fuel rods continues. There is no fuel rod in the core of the plant.
- The Onagawa nuclear power plant keeps power supply from outside though two power lines out of the three have been cut. There is no significant change in the readings of the monitoring posts. The cooling of the spent fuel rods continues.
- There is no significant change in the readings of the monitoring posts of the Fukushima Dai-ichi nuclear power plant. Water injection into the reactor continues.
- There is no significant change of the parameters of the Fukushima Dai-ni nuclear power plant.
- There is no trouble seen with the Tokai Dai-ni nuclear power plant.

Contact: International Nuclear Energy Cooperation Division, Tel 03-5501-8227

Response Modes



The NRC's response to an event may range from routine follow-up activities to a complete activation of both the Regional Incident Response Center and the Headquarters Operations Center. The NRC uses the following formal modes for responding to events at its licensed facilities:

Monitoring - A heightened state of readiness for incident information acquisition and assessment.

Activation - The NRC staffs its Headquarters Operations Center and Regional Incident Response Centers and declares the agency "Activated" for incident response. The regional office may prepare a team of specialists to rapidly travel to the site if needed.

Expanded Activation - Headquarters Operations Center and Regional Incident Response Centers are fully staffed. If the situation warrants, an NRC site team has been dispatched to and arrived at the incident site to interact with the licensee and other Federal entities.

The NRC may sometimes enter a response mode for a non-emergency event or in response to a non-reportable event. Examples would be when NRC is in response to a hurricane that threatens one or more facilities, or in response to a specific terrorist threat.

JJJ/274

Droggitis, Spiros

From: Decker, David
Sent: Thursday, April 07, 2011 1:15 PM
To: Schmidt, Rebecca; Powell, Amy; Droggitis, Spiros; OCA Distribution
Subject: RE: New earthquake

Here's some info from the Ops Center:

1) Apparently, the earlier tsunami warning in Japan has been lifted.
2) I'm hearing reports of an unnamed "another" plant in Japan that has lost off-site power and is operating on emergency diesel generators. No additional info on that yet.
3) Becky's Question Input - Back on 3/11/11 the decision to go into "Monitoring Response Mode" due to the earthquake/tsunami in Japan was made at 9:46am, and Commissioners (among other senior mgmt and "need-to-know'ers") were notified via e-mail at 10:08am.

David

-----Original Message-----
From: Decker, David
Sent: Thursday, April 07, 2011 12:36 PM
To: Schmidt, Rebecca; Powell, Amy
Subject: New earthquake

Word here in ops ctr is that there is no new damage from earthquake of 7.1. Also, no changes in water levels anywhere at the site. This is the biggest earthquake/aftershock since last month. Info we have is from tepco and their camera analysis. Workers believed to have evacuated as a tsunami precaution. Tsunami predictions are that it will be small, and may have passed already. White house asking is workers have sent back inside. White House Press briefing upcoming and this may come up.

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Garcia-Santos, Norma

From: Ordaz, Vonna
Sent: Thursday, April 07, 2011 7:40 AM
To: Weaver, Doug; White, Bernard; Rahimi, Meraj; Pstrak, David; Benner, Eric; Waters, Michael; Garcia-Santos, Norma; Witt, Kevin; Easton, Earl; Gambone, Kimberly; Bjorkman, Gordon; Berry, Rollie
Subject: Fw: 0430 EDT (April 7, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: NRC Status Update 4.07.11--0430EDT.pdf

Take a look at the highlighted portion on page 5 re: core damage and doses...

From: LIA07 Hoc
To: LIA07 Hoc
Sent: Thu Apr 07 04:54:07 2011
Subject: RE: 0430 EDT (April 7, 2011) USNRC Earthquake/Tsunami Status Update

Attached, please find a 0430 EDT, April 7, 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
Executive Briefing Team Coordinator
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)
james.anderson@nrc.gov

JJJ/276

News Release

経済産業省 Ministry of Economy, Trade and Industry

April 7, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 78th Release)
(As of 8:00 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.

- 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)
- The outflow of the contaminated water from around the Pit for the Conduit near the Inlet Bar Screen of Unit 2 was confirmed to stop. 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)
- Fresh water spray for Unit 3 using Concrete Pump Truck (50t/h) was started. (06:53 April 7th)
- In the samples of soil (7 samples in total) collected on 25 March (at 4 points) and 28 March (at 3 points) in 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 outflow of the contaminated water from the

JJJ/277

(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 06:00 April 7th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.464(A) 0.859(B)	0.083(A) 0.076(D)	0.099(A) 0.022(C)	−	0.103	0.106
CV Pressure (D/W) [kPa]	155	100	107.5	−	−	−
Reactor Water Level*2 [mm]	-1,650(A) -1,650(B)	-1,500(A) Not available(B)	-1,850(A) -2,250(B)	−	1,822	1,866
Suppression Pool Water Temperature (S/C) [℃]	−	−	−	−	−	−
Suppression Pool Pressure (S/C) [kPa]	155	down scale (under survey)	172.9	−	−	−
Spent Fuel Pool Water Temperature [℃]	Indicator Failure	48.0	Indicator Failure	Indicator Failure	34.8	21.5
Time of Measurement	06:00 April 7th	06:00 April 7th	06:00 April 7th	April 7th	06:00 April 7th	06:00 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 08:00 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. <u>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)</u>
- 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)
- White smoke was confirmed to generate continuously. (As of <u>06:30</u> April <u>7th</u>)
- Fresh water injection to RPV is being carried out. (As of <u>08:00</u> April <u>7th</u>)

<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 using Concrete Pump Truck (50t/h) was started. (06:53 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 08:30 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 08:00 April 6th, water temperature of the pool was around 27℃.

<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 (Around 10,000t) 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 outflow of the contaminated water 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 preventthe 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 06:00 April 7th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.13	0.10	0.17
Reactor water temperature	℃	25.3	25.4	36.0	30.3
Reactor water level*2	mm	9,346	10,346	7,818	8,785
Suppression pool water temperature	℃	23	24	26	31
Suppression pool pressure	kPa (abs)	105	103	110	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. 0.38 μ SV/h (16:00 April 6th) (Approx. 0.40 μ SV/h (16:00 April 5th))

(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 4th, the screening was done to 128,798 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)
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Fukushima Dai-ichi Nuclear Power Station Major Parameters of the Plant (As of 14:00, April 8th)

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 : 6 m^3/h (As of 17:30, April 3rd) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water : 7 m^3/h (As of 19:00, April 7th) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water: 7 m^3/h (As of 17:32, April 3rd) temporary measuring instrument	Under shutdown	Under shutdown	Under shutdown
Reactor water level	Fuel range A : -1,650mm Fuel range B : -1,650mm (As of 12:00, April 8th)	Fuel range A : -1,500mm (As of 12:00, April 8th)	Fuel range A:-1,850mm Fuel range B:-2,250mm (As of 12:00, April 8th)	#2	Shutdown range measurement 1,644mm (As of 14:00, April 8th)	Shutdown range measurement 1,668mm (As of 14:00, April 8th)
Reactor pressure	0.395MPa g(A) 0.793MPa g(B) (As of 12:00, April 8th)	-0.020MPa g (A) -0.020MPa g (D) (As of 12:00,April 8th)	-0.004MPa g (A) -0.079MPa g (C) (As of 12:00, April 8th)	#2	0.003MPa g (As of 14:00, April 8th)	0.005MPa g (As of 14:00, April 8th)
Reactor water temperature	(Impossible collection due to low system flow rate)			#2	45.5℃ (As of 14:00, April 8th)	22.7℃ (As of 14:00, April 8th)
Reactor Pressure Vessel (RPV) temperature	Feedwater nozzle temperature: 246.6℃(under survey) Temperature at the bottom head of RPV: 119.4℃ (As of 13:00, April 8th)	Feedwater nozzle temperature: 141.2℃ Temperature at the bottom head of RPV: #1 (As of 12:00, April 8th)	Feedwater nozzle temperature: 88.8℃ (under survey) Temperature at the bottom head of RPV: 110.7℃ (As of 12:00, April 8th)	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: 0.185MPa abs S/C: 0.155MPa abs (As of 13:00, April 8th)	D/W: 0.100MPa abs S/C:Down scale (under survey) (As of 12:00, April 8th)	D/W: 0.1052MPa abs S/C: 0.1722MPa abs (As of 12:00, April 8th)	#2		
CAMS*3	D/W: 6.83×10^1 Sv/h(under survey) S/C: 1.22×10^1Sv/h (As of 13:00, April 8th)	D/W: 2.94×10^1Sv/h S/C: 7.65×10^{-1}Sv/h (As of 12:00,April 8th)	D/W: 1.88×10^1Sv/h S/C: 7.38×10^{-1}Sv/h (As of 12:00, April 8th)	#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	53.0℃ (As of 12:00, April 8th)	#1	#1	34.7℃ (As of 14:00, April 8th)	30.5℃ (As of 8:00, April 8th)
FPC skimmer level	4,500mm (As of 12:00, April 8th)	5,500mm (As of 12:00, April 8th)	#1	4,900mm (As of 12:00, April 8th)	#2	
Power supply	Receiving external power supply (P/C*4 2C)		Receiving external power supply (P/C4D)		Receiving external power supply	

Other information	Unit2: Confirmed the indicated value of S/C Pressure but continuing to survey the transition of condition Unit3: Collecting the data of RPV temperature and continuing survey for transitional situation Unit1: Collecting the data of feedwater nozzle temperature and CAMS(D/W) and continuing survey for transitional situation	Common pool: about 28 ℃ (As of 7:20, April 8th)	Unit5: Supplemental Fuel Pool Cooling mode (From 10:22 April 8th)	Unit6: SHC*5 mode (From 10:16 April 7th)

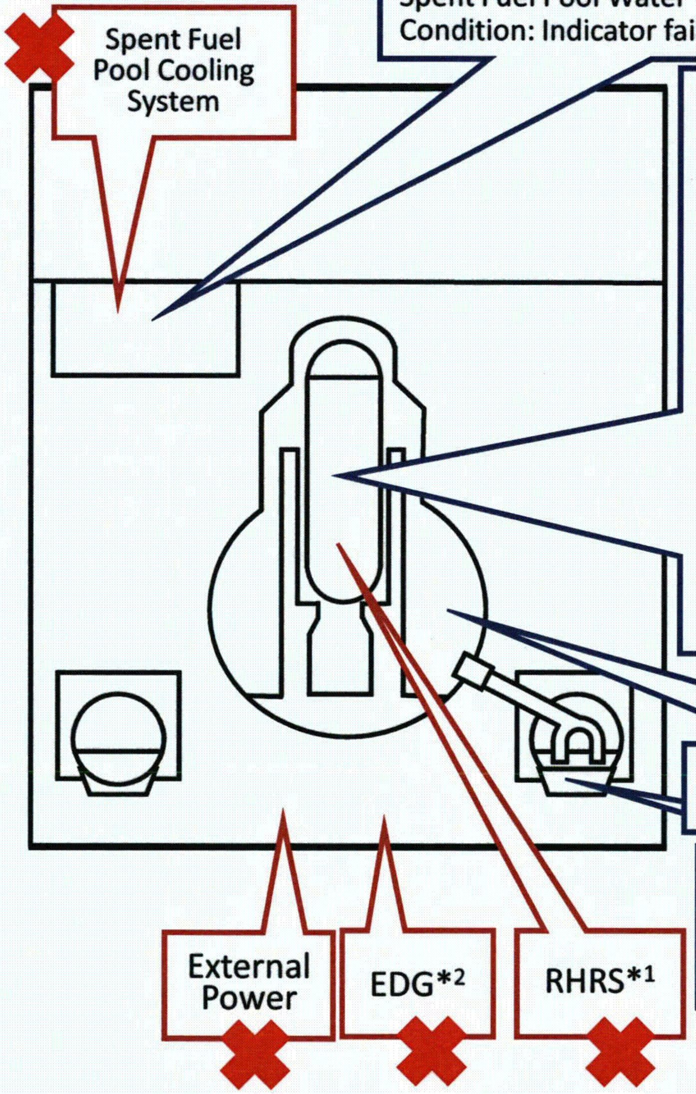
Pressure conversion	Gauge pressure (MPa g) = Absolute pressure (MPa abs) – Atmospheric pressure (Normal atmospheric pressure 0.1013MPa) Absolute pressure (MPa abs) = Gauge pressure (MPa g) + Atmospheric pressure (Normal atmospheric pressure 0.1013MPa)

*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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1

(As of 13:00 April 6th, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition: Indicator failure

Reactor Pressure A 0.414MPa*
Reactor Pressure B 0.754MPa*
Condition : No large fluctuation
*converted to absolute pressure
Reactor Water Level A −1,650mm
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 :214.0℃
Temperature at the bottom head of RPV :115.0℃

PCV*3 Pressure 0.150MPa
Condition: No large fluctuation

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure 0.150MPa
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. ($2m^3/h \rightarrow 18m^3/h$)
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 12:00 ～2nd 15:26 Started to transfer the stagnant water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
31st 13:03～16:04 Water spray by Concrete Pump Truck (Fresh water)
3rd 12:02 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
3rd 13:55 Started to transfer the water from the condenser to CST.

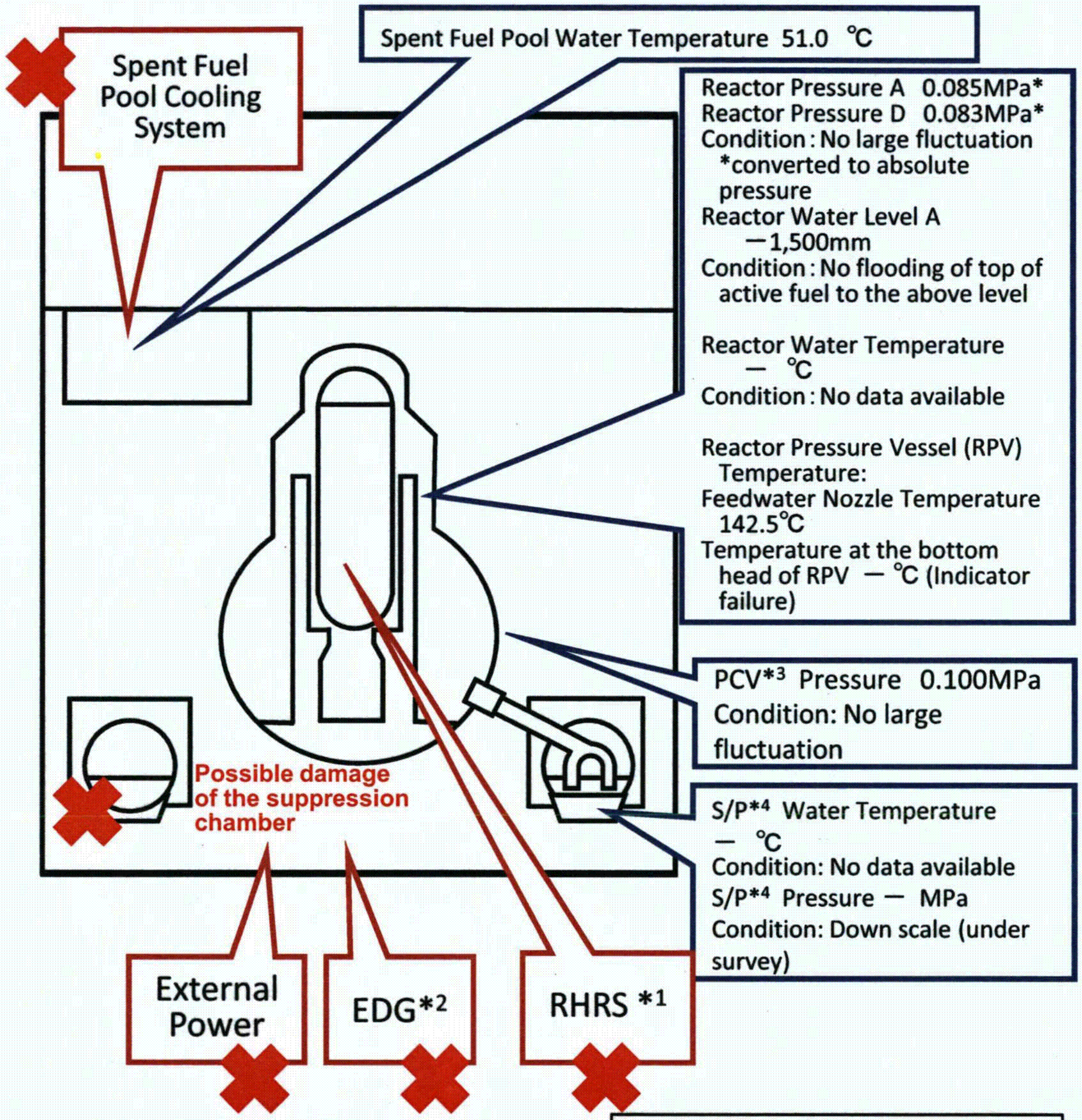
*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Primary Containment Vessel
*4 Suppression Pool

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 13:00 April 6th, 2011)



*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

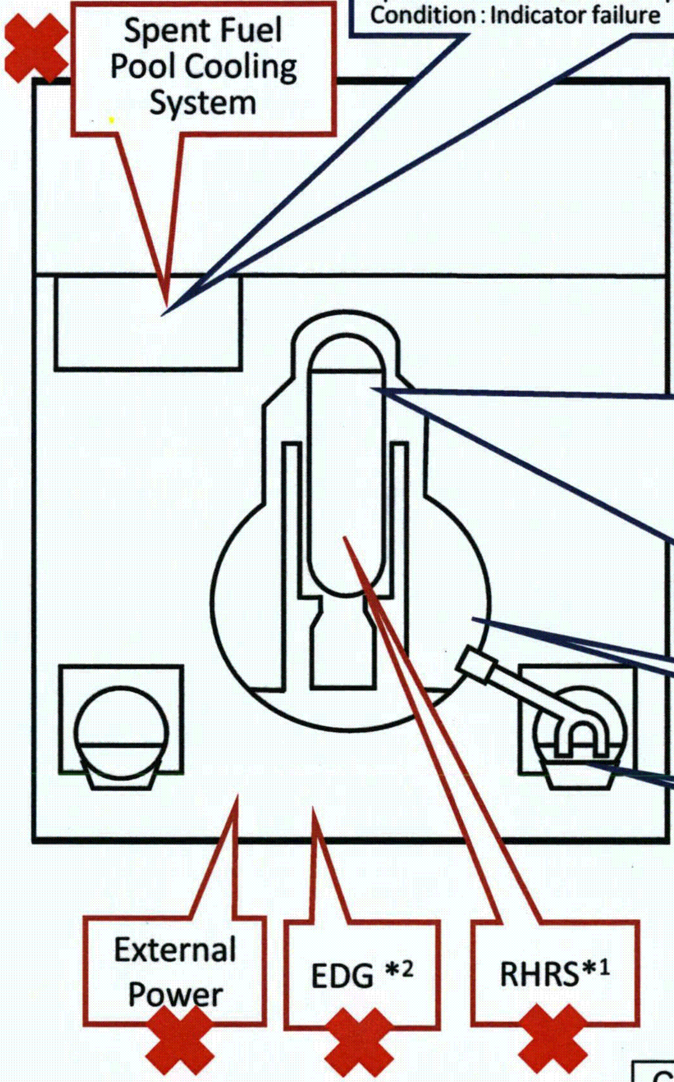
Major Events after the earthquake

- 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 seawater 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.
- 29th 16:45〜1st 11:50 Transferred the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
- 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)
- 1st 14:56〜17:05 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
- 2nd around 9:30 The water, of which the dose rate was at the level of more than 1,000mSv/h, was confirmed to be collected in the pit located near the Intake Channel of Unit 2. The outflow from the lateral surface of the pit into the sea was also confirmed.
- 2nd 17:10 Started to transfer the water from the condenser to the Condensate Storage Tank (CST).
- 3rd 12:12 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
- 3rd 13:47〜14:30 20 bags of sawdust, 80 bags of high polymer absorbent and 3 bags of cutting-processed newspaper were put into the Pit for the Conduit.
- 4th 7:08〜7:11 Approximately 13kg of tracer (bath agent) was put in from the Pit for the Duct for Seawater Pipe.
- 4th 11:05〜13:37 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
- 5th 14:15 Tracer is confirmed to outflow through the permeable layer around the pit into the sea.
  15:07 Started to inject coagulant.
- 6th around 5:38 The water outflow from the lateral surface of the pit was confirmed to stopped.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

(As of 13:00 April 6th, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition : Indicator failure

Reactor Pressure A 0.106MPa*
Reactor Pressure C 0.015MPa*
Condition : No large fluctuation
*converted to absolute pressure
Reactor Water Level A −1,800mm
Reactor Water Level B −2,200mm
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 :78.8℃(under survey)
Temperature at the bottom head of RPV : 115.0℃

PCV*3 Pressure 0.1069MPa
Condition: No large fluctuation

S/P*4 Water Temperature − ℃
Condition : No data available
S/P*4 Pressure 0.1731MPa
Condition: No large fluctuation

*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

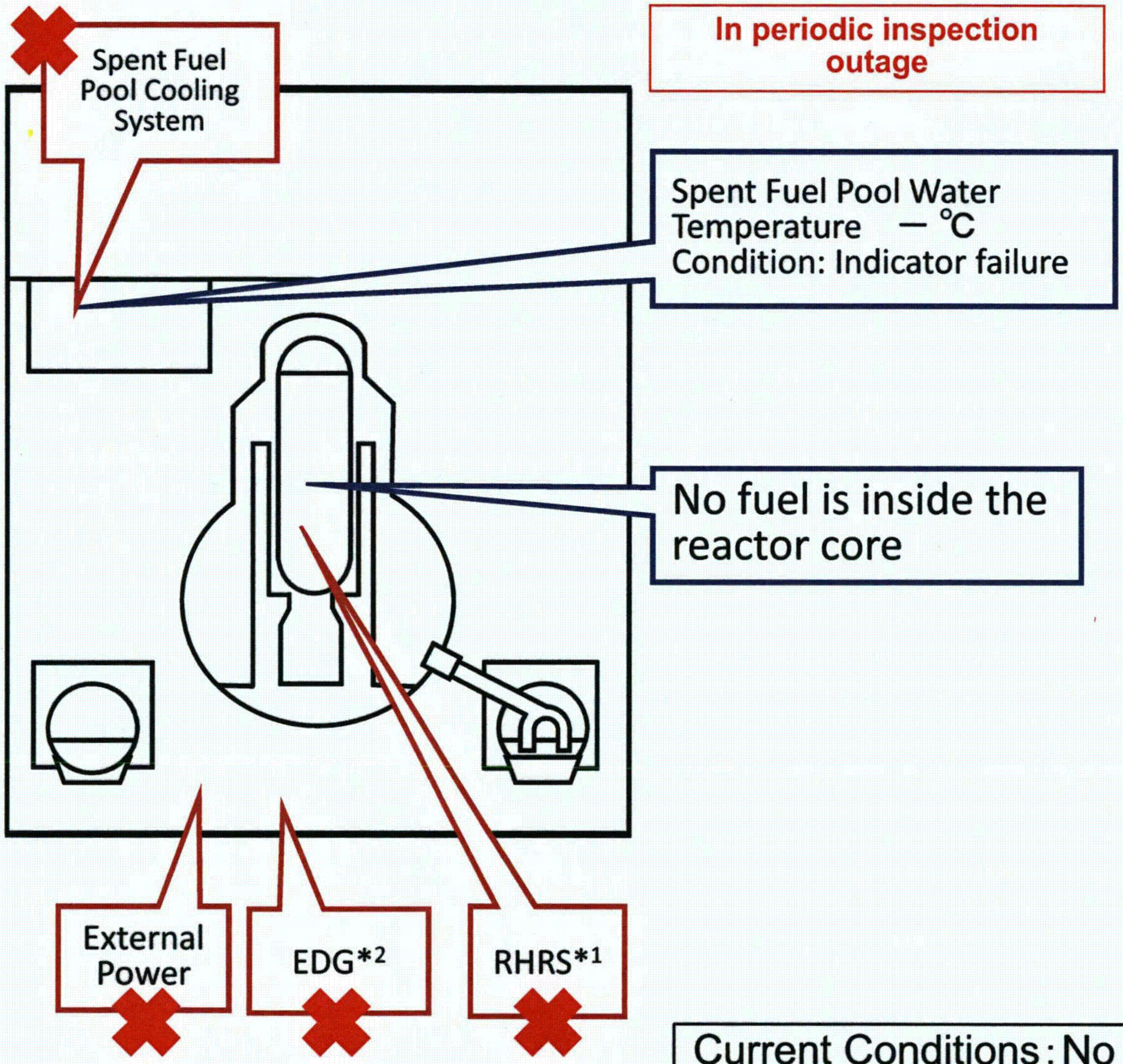
Major Events after the earthquake

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 around 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 17:40〜31st around 8:40 Transferring the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
28th 20:30 Switched to the water injection to the core using a temporary motor-driven pump.
29th 14:17〜18:18, 31st 16:30〜19:33, 2nd 09:52〜12:54, 4th 17:03〜19:19 Water spray by Concrete Pump Truck (Fresh water)
3rd 12:18 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4

(As of 13:00 April 6th, 2011)



*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 around 15:00 Work for laying cable to Power Center was completed.

22nd 10:35 Power Center received electricity.

22nd 17:17〜20:32, 23rd 10:00〜13:02, 24th 14:36〜17:30, 25th 19:05〜22:07, 27th 16:55〜19:25

Water spray by Concrete Pump Truck

25th 06:05〜10:20 Sea water injection to SFP via the Fuel Pool Cooling Line (FPC)

29th 11:50 Lighting in the Central Control Room was recovered.

30th 14:04〜18:33, 1st 8:28〜14:14, 3rd 17:14〜22:16, 5th 17:35〜18:22

Water spray by Concrete Pump Truck (Fresh water)

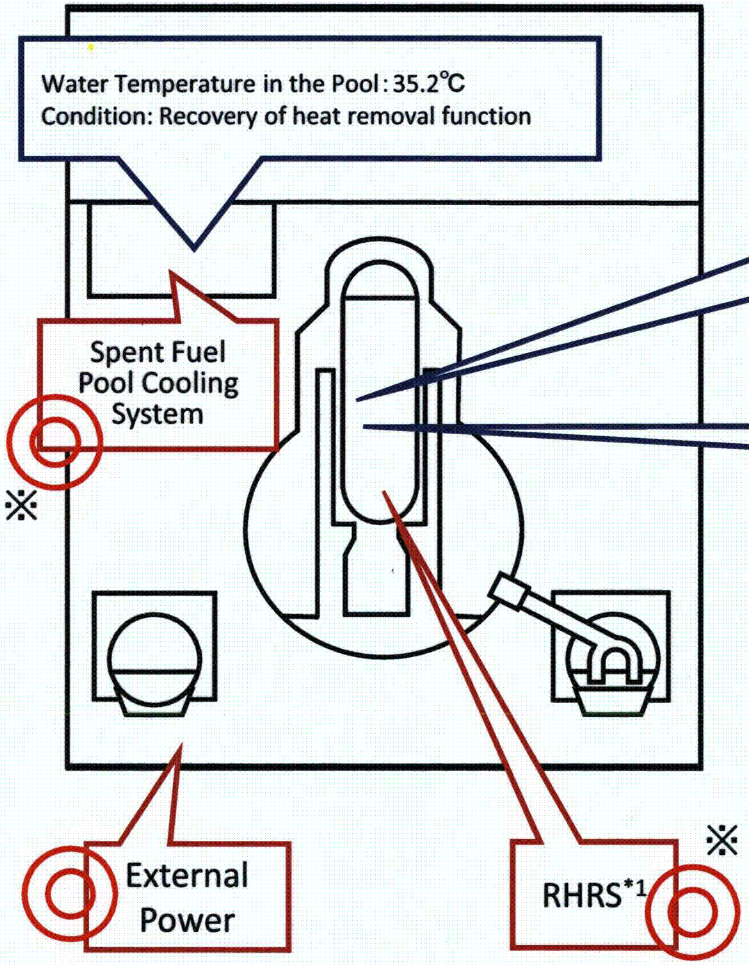
**Current Conditions: No fuel is in RPV*3.
Fresh water is being injected to the Spent Fuel Pool.**

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5

(As of 13:00 April 6th, 2011)

In periodic inspection outage



Reactor Pressure : 0.106MPa*
Reactor Water Level : 1,965mm
Reactor Water Temperature : 42.3℃
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.

4th 21:00 Started to discharge the groundwater with low-level radioactivity in the Sub Drain Pit to the sea.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 13:00 April 6th, 2011)

In periodic inspection outage

The Emergency Diesel Generator (D/G) 6A was excluded from standby because of insulation resistance insulation drop.

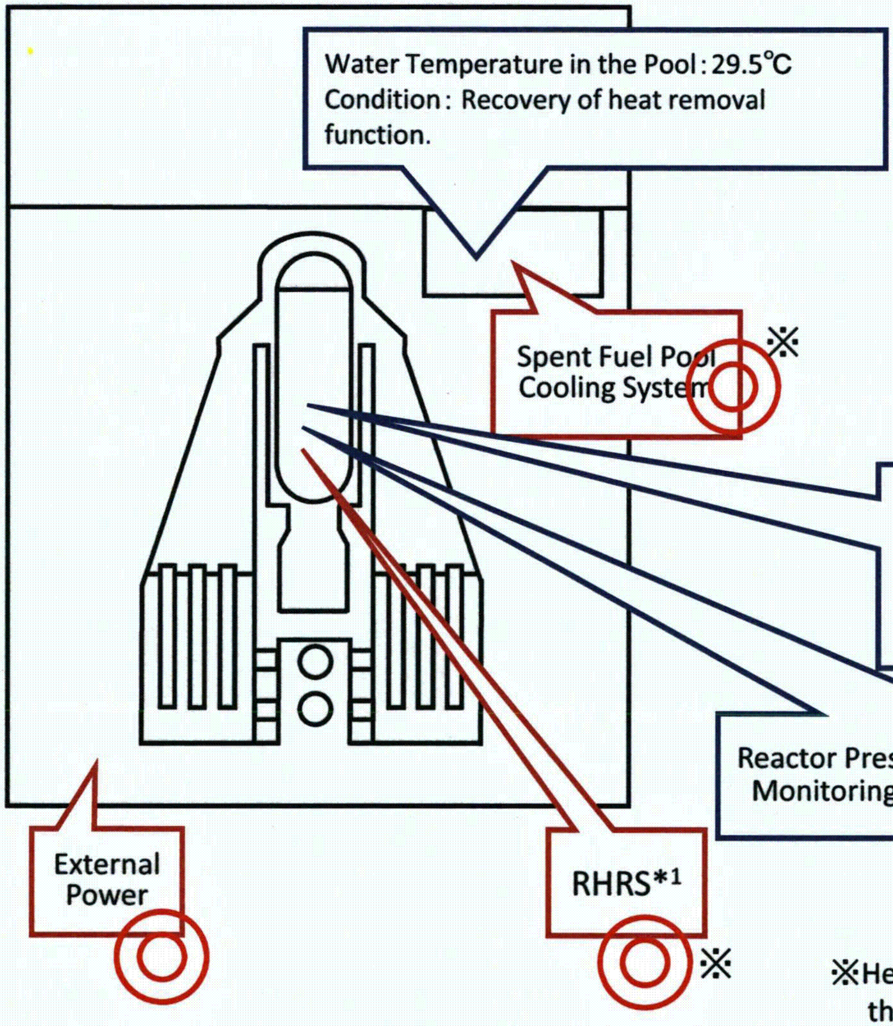
Current Conditions:

20th 19:27 Cold shutdown

22nd 19:17 Receiving electricity from external power supply

4th 21:00 Started to discharge the groundwater with low-level radioactivity in the Sub Drain Pit to the sea.

6th 9:00 The Emergency Diesel Generator (D/G) 6A was put out of service due to the malfunction of the insulation resistance.



Reactor Pressure: 0.106MPa*
Reactor Water Level: 1,791mm
Rector Water Temperature: 21.1℃
Condition: Pressure is under control.
*converted to absolute pressure

Reactor Pressure Vessel Temperature:
Monitoring by Reactor Water Temperature

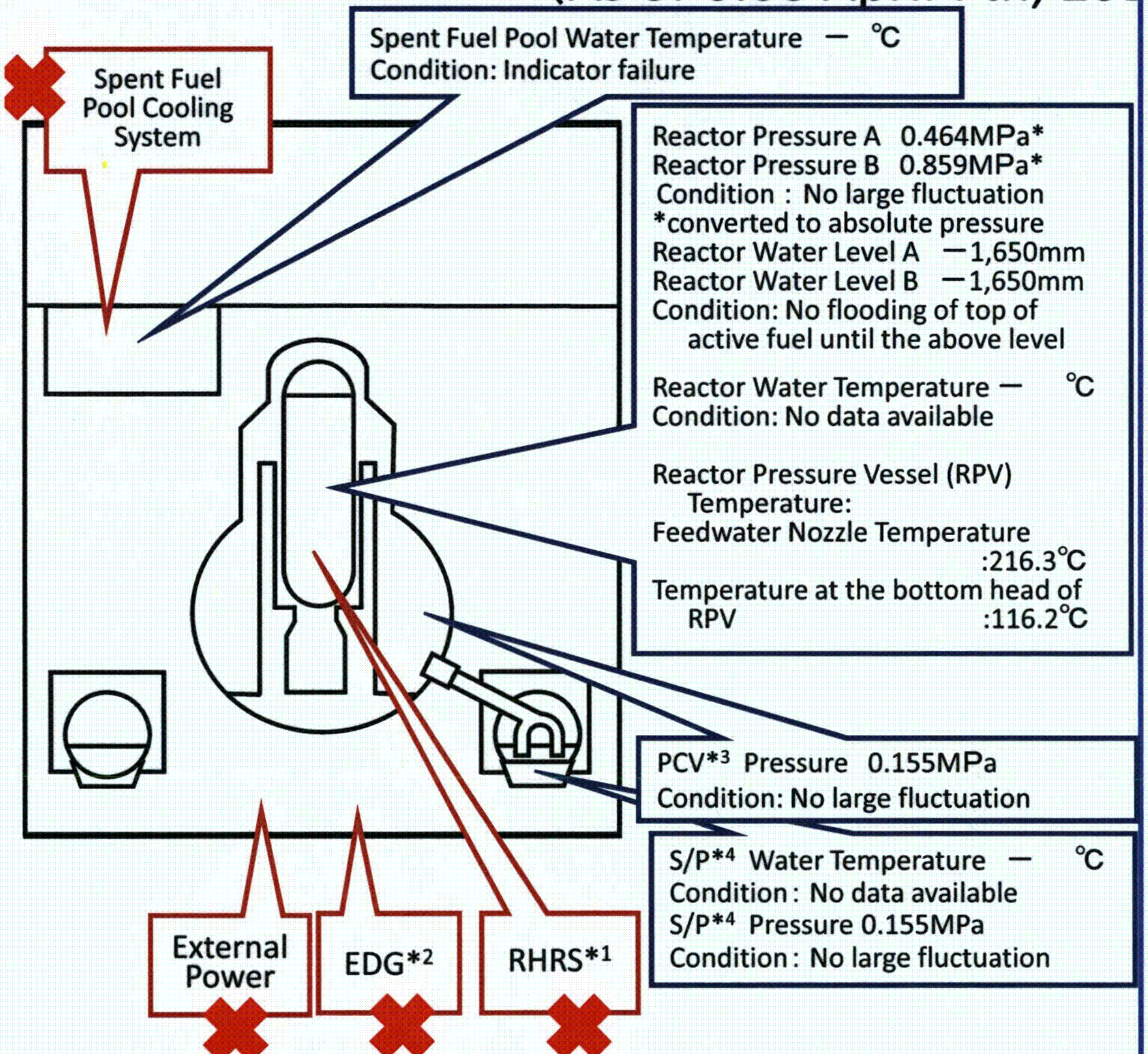
*1 Residual Heat Removal System

※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)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1

（As of 6:00 April 7th, 2011）



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. (2m³/h →18m³/h)
  09:00 Switched to the Feedwater Line only.(18m³/h →11m³/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 12:00 ～2nd 15:26 Started to transfer the stagnant water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
- 31st 13:03～16:04 Water spray by Concrete Pump Truck (Fresh water)
- 3rd 12:02 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
- 3rd 13:55 Started to transfer the water from the condenser to CST.
- 6th 22:30 Started operation for injection of nitrogen to reactor containment
- 7th 01:31 Confirmed starting injection of nitrogen to reactor containment

*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

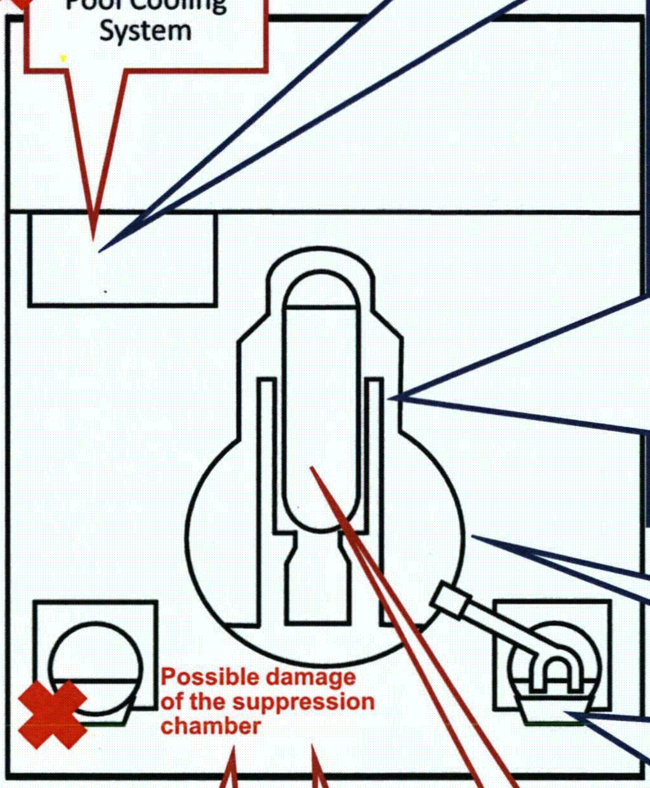
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2

(As of 6:00 April 7th, 2011)

Spent Fuel Pool Cooling System

Spent Fuel Pool Water Temperature 48.0 ℃



Reactor Pressure A 0.083MPa*
Reactor Pressure D 0.076MPa*
Condition : No large fluctuation
*converted to absolute pressure

Reactor Water Level A
－1,500mm
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
144.2℃
Temperature at the bottom head of RPV － ℃ (Indicator failure)

PCV*3 Pressure 0.100MPa
Condition: No large fluctuation

S/P*4 Water Temperature
－ ℃
Condition: No data available
S/P*4 Pressure － MPa
Condition: Down scale (under survey)

External Power

EDG*2

RHRS *1

*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)

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)
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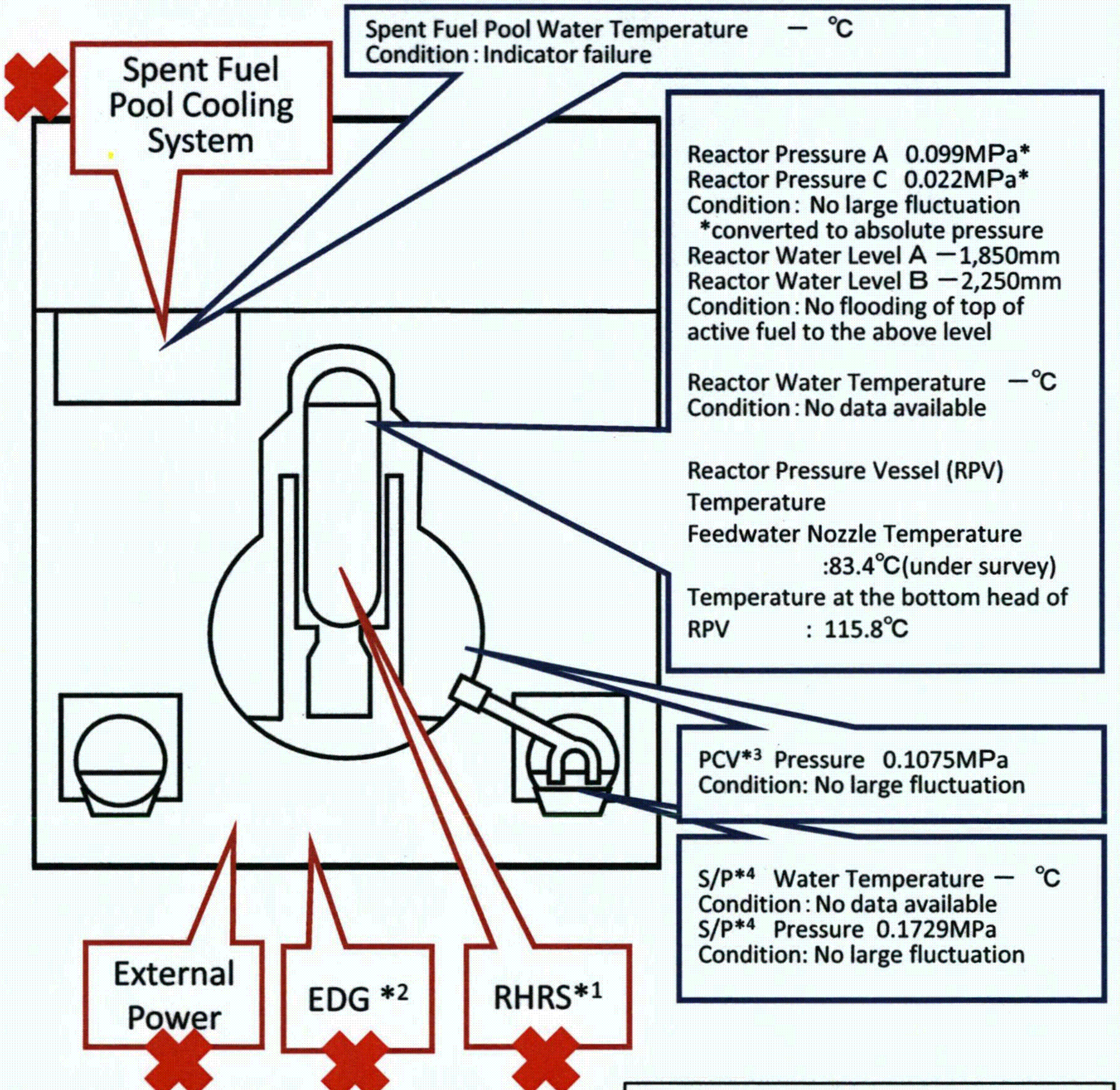
13th 11:00 Started to vent.
14th 13:25 Occurrence of the Article 15 event (Loss of reactor cooling functions)
14th 16:34 Started to inject seawater to the Reactor Core.
14th 22:50 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
15th 00:02 Started to vent.
15th 06:10 Sound of 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.
29th 16:45～1st 11:50 Transferred the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
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)
1st 14:56～17:05 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
2nd around 9:30 The water, of which the dose rate was at the level of more than 1,000mSv/h, was confirmed to be collected in the pit located near the Intake Channel of Unit 2. The outflow from the lateral surface of the pit into the sea was also confirmed.
2nd 17:10 Started to transfer the water from the condenser to the Condensate Storage Tank (CST).
3rd 12:12 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
3rd 13:47～14:30 20 bags of sawdust, 80 bags of high polymer absorbent and 3 bags of cutting-processed newspaper were put into the Pit for the Conduit.
4th 7:08～7:11 Approximately 13kg of tracer (bath agent) was put in from the Pit for the Duct for Seawater Pipe.
4th 11:05～13:37 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
5th 14:15 Tracer is confirmed to outflow through the permeable layer around the pit into the sea.
15:07 Started to inject coagulant.
6th around 5:38 The water outflow from the lateral surface of the pit was confirmed to stopped.

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

(As of 6:00 April 7th, 2011)



*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

Major Events after the earthquake

11th 14:46 Under operation, Automatic shutdown by the earthquake
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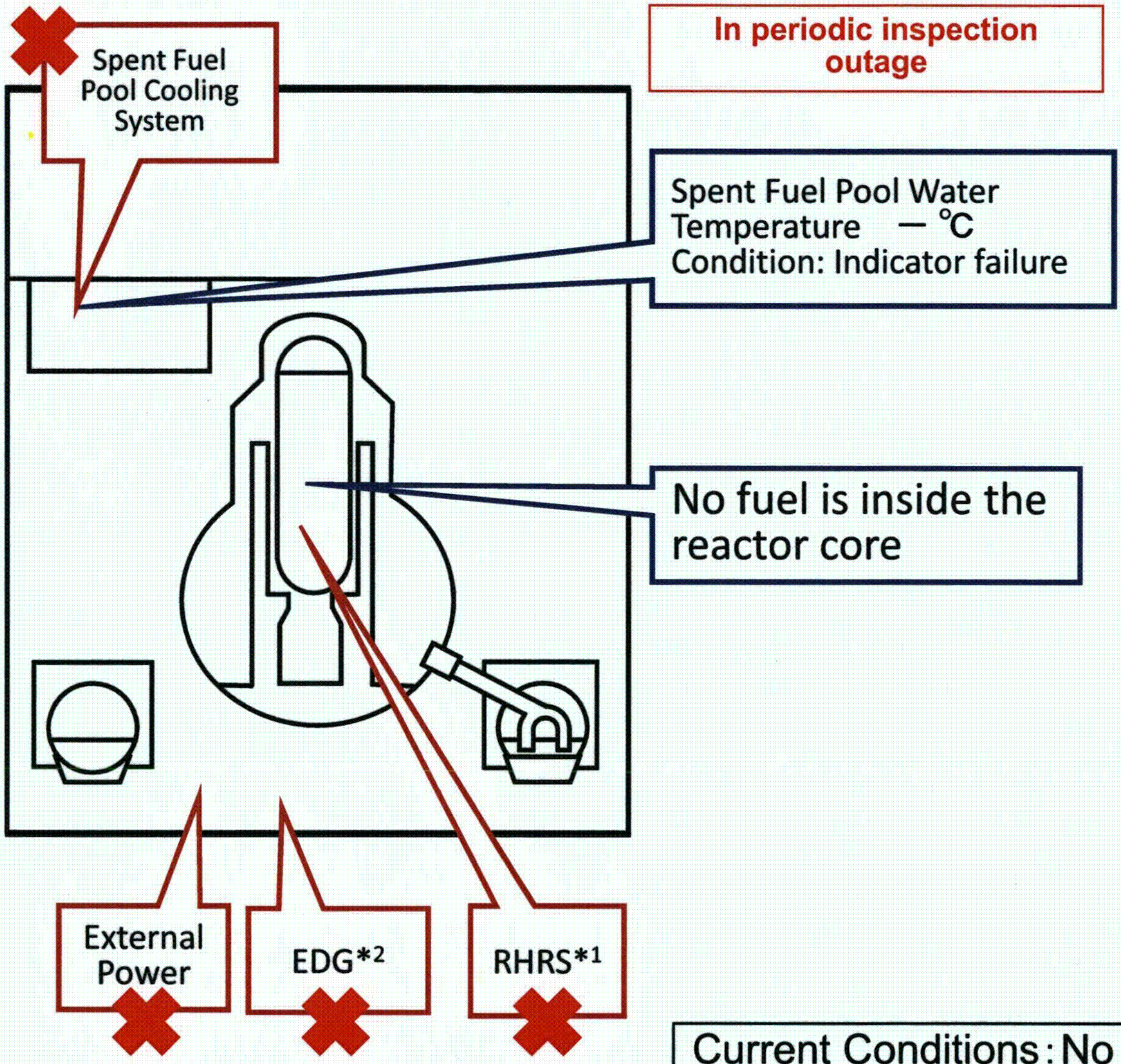
13th 13:12 Started to inject seawater and borated water to core.
14th 05:20 Started to vent.
14th 07:44 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
14th 11:01 Sound of explosion
16th around 08:30 White smoke generated.
17th 09:48〜10:01 Water discharge by the helicopters of 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 around 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 17:40〜31st around 8:40 Transferring the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
28th 20:30 Switched to the water injection to the core using a temporary motor-driven pump.
29th 14:17〜18:18, 31st 16:30〜19:33, 2nd 09:52〜12:54, 4th 17:03〜19:19 Water spray by Concrete Pump Truck (Fresh water)
3rd 12:18 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
7th 06:53 Started water spray by Concrete Pump Truck (Fresh water)

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
(As of 6:00 April 7th, 2011)



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

Major events after the earthquake

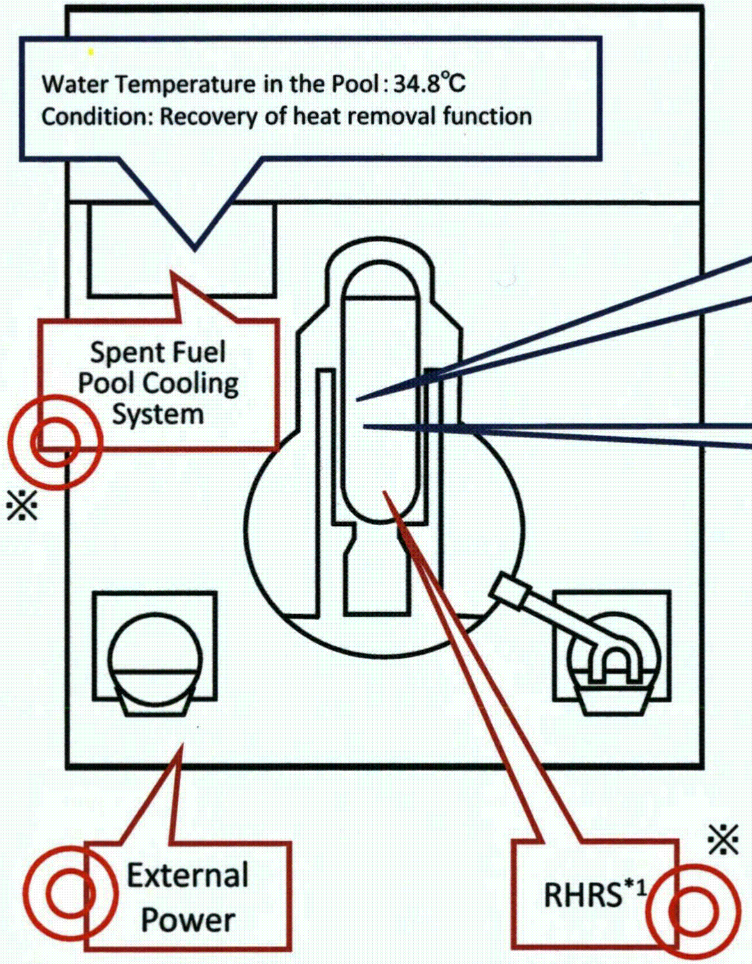
In periodic inspection outage when the earthquake occurred
14th 04:08 Water temperature in the Spent Fuel Pool (SFP), 84℃
15th 06:14 Confirmed the partial damage of wall in the 4th floor.
15th 09:38 Fire occurred in the 3rd floor. (12:25 extinguished)
16th 05:45 Fire occurred. TEPCO couldn't confirm 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 around 15:00 Work for laying cable to Power Center was completed.
22nd 10:35 Power Center received electricity.
22nd 17:17〜20:32, 23rd 10:00〜13:02, 24th 14:36〜17:30, 25th 19:05〜22:07, 27th 16:55〜19:25
Water spray by Concrete Pump Truck
25th 06:05〜10:20 Sea water injection to SFP via the Fuel Pool Cooling Line (FPC)
29th 11:50 Lighting in the Central Control Room was recovered.
30th 14:04〜18:33, 1st 8:28〜14:14, 3rd 17:14〜22:16, 5th 17:35〜18:22
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 6:00 April 7th, 2011)

In periodic inspection outage



Reactor Pressure : 0.103MPa*
Reactor Water Level : 1,822mm
Reactor Water Temperature : 34.8℃
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.

4th 21:00 Started to discharge the groundwater with low-level radioactivity in the Sub Drain Pit to the sea.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 6:00 April 7th, 2011)

In periodic inspection outage

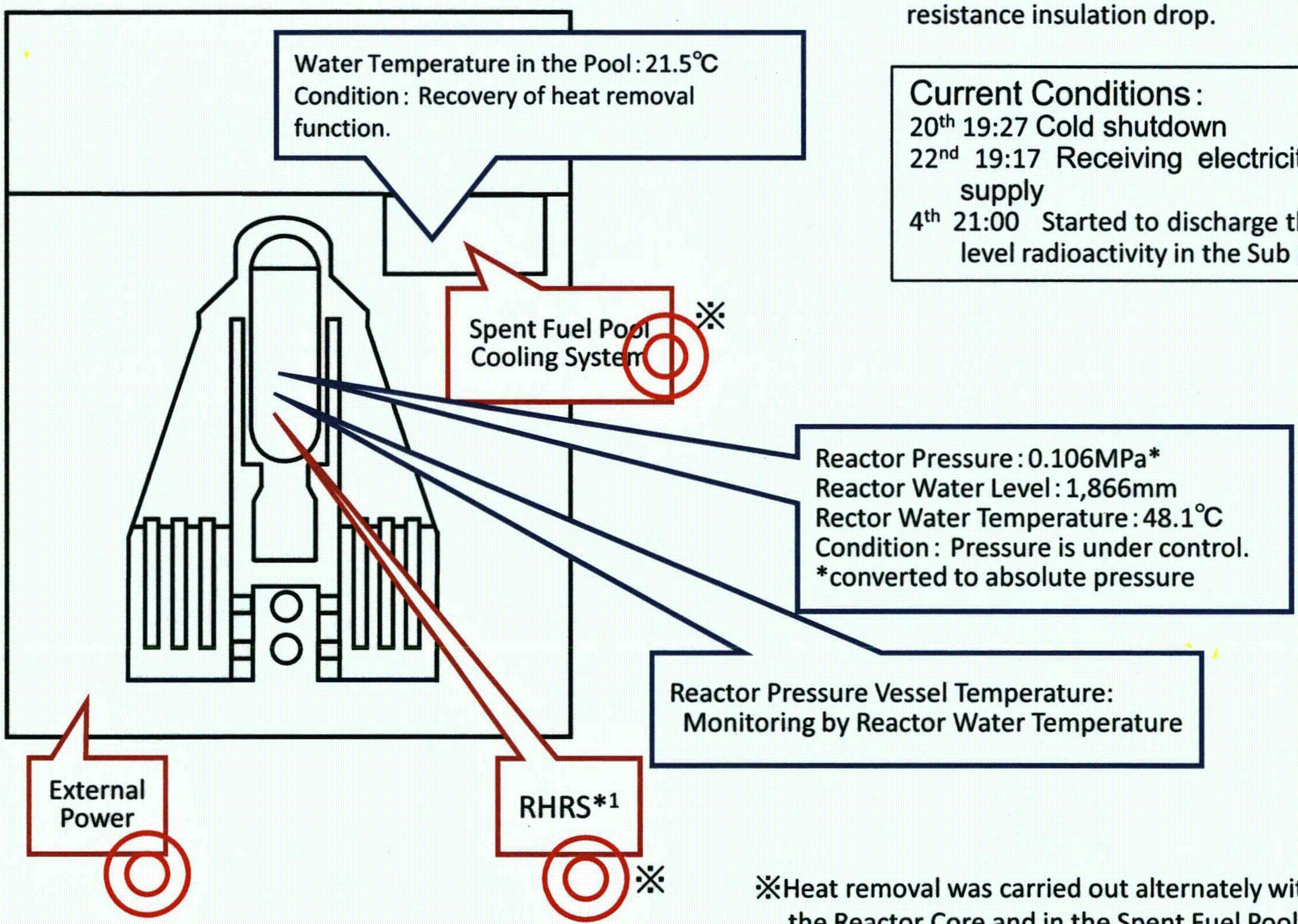
The Emergency Diesel Generator (D/G) 6A was excluded from standby because of insulation resistance insulation drop.

Current Conditions:

20th 19:27 Cold shutdown

22nd 19:17 Receiving electricity from external power supply

4th 21:00 Started to discharge the groundwater with low-level radioactivity in the Sub Drain Pit to the sea



*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)

United States Senate
COMMITTEE ON APPROPRIATIONS
WASHINGTON, DC 20510–6025
http://appropriations.senate.gov

April 8, 2011

The Honorable Gregory Jaczko
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Chairman Jaczko:

I am writing to ask that you seriously consider regulatory policies that would encourage the movement of nuclear fuel, once sufficiently cool, out of spent fuel pools and into dry cask storage systems. I am concerned that current Nuclear Regulatory Commission policies allow excessive re-racking and densification of radioactive fuel within spent fuel pools. In fact, there are examples in the U.S. where nuclear fuel rods have been stored in spent fuel pools for decades.

According to "Safety and Security of Commercial Spent Nuclear Fuel Storage," a report published in 2006 by the National Research Council at the request of Congress, dry cask storage systems have inherent safety advantages over spent fuel pool storage. The report highlighted three main differences between these two storage options:

1. **Less spent fuel is at risk in an accident or attack on a dry storage cask than on a spent fuel pool.** An accident or attack on a dry cask facility would likely affect only a few casks at a time. An accident or attack on a spent fuel pool places the entire fuel inventory at risk.

2. **The consequences of an accident or terrorist attack on a dry cask storage facility are lower than those for a spent fuel pool.** If an accident or attack on a dry cask facility resulted in radioactive material being released, the dispersion could likely be contained easier than if a spent fuel pool were compromised.

3. **The recovery from an attack on a dry cask would be much easier than the recovery from an attack on a spent fuel pool.** Containing radiation that could be released from damage to dry casks can be plugged temporarily with radiation-absorbing materials until permanent fixes are available. Containing radiation from a compromised spent fuel pool is likely to be much more difficult, particularly if the overlying building collapsed preventing workers from reaching the pool.

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When taken together, these points assert that the risk of a non-recoverable accident decreases when spent nuclear fuel is kept in smaller, easier to manage, containers that are distributed intelligently on a secure site. The continuous re-racking and addition of fuel rods in spent fuel pools appears to be at odds with these safety recommendations. Based on these findings, I ask the NRC to initiate a rulemaking process to immediately require a more rapid shift of spent fuel to dry casks.

The lesson from Japan's disaster is that we must be prepared to respond to unanticipated threats. Therefore, any policy changes that further reduce risks of an unsafe situation catching the industry off guard should be implemented. I look forward to working with you further on this issue.

Sincerely,

Dianne Feinstein

Dianne Feinstein
Chairman
Subcommittee on Energy and Water Development

DF/mbn/ac

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CHAIRMAN

April 8, 2011

The Honorable Barbara Boxer
Chairman, Committee on Environment
and Public Works
United States Senate
Washington, D.C. 20510

Dear Madam Chairman:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter of March 17, 2011. In light of the recent events in Japan, you asked that NRC perform a thorough review of nuclear power plants and posed a number of questions. Detailed responses to the questions contained in your letter are provided in the enclosure.

Regarding a review of the California facilities, the Commission directed the NRC staff to establish a senior level agency task force to conduct a methodical and systematic review of our processes and regulations to determine whether the agency should make additional improvements to our regulatory system. This activity will have both near-term and longer-term objectives. We will keep you and our other stakeholders informed as we proceed.

While the NRC continues to provide assistance to the Japanese government, I want to assure you that we continue to make our domestic responsibilities for licensing and oversight of the U.S. licensees our top priority and that the U.S. plants continue to operate safely. With our near-term evaluation of the relevance of recent events to the U.S. fleet underway, we are continuing to gather the information necessary for us to take a longer, more thorough look at the events in Japan and their lessons for us. Based on these efforts, the agency will take all appropriate actions necessary to ensure the continuing safety of the American public.

Sincerely,

Gregory B. Jaczko

Gregory B. Jaczko

Enclosure: As stated

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Identical letter sent to

The Honorable Barbara Boxer
Chairman, Committee on Environment
and Public Works
United States Senate
Washington, D.C. 20510

The Honorable Tom Carper
United States Senate
Washington, D.C. 20510

Responses to Questions from Senator Barbara Boxer and Senator Tom Carper
Letter of March 17, 2011

1. Please identify all U.S. nuclear facilities subject to significant seismic activity and/or tsunamis.

Although we often think of the US as having "active " and non-active" earthquake zones, earthquakes can actually happen almost anywhere. Seismologists typically separate the US into low, moderate and high seismicity zones. The NRC requires that every nuclear plant be designed for site-specific ground motions that may be expected at their locations. In addition, the NRC has specified a minimum ground motion level to which all nuclear plants must be designed. The designation of the general type of seismic zone that may apply at any specific site is subject to interpretation but a conservative interpretation – meaning a larger zone—might include the following plants, based upon a preliminary estimate:

High Seismicity – Diablo Canyon, SONGS

Moderate Seismicity – Brunswick, Robinson, Summer, Vogtle, Hatch, Clinton, Watts Bar, Sequoya, North Anna

Low Seismicity – all other plants

2. U.S. nuclear power plants are designed to be safe based on historical data of the area's maximum credible threat (including earthquakes and tsunamis). What extra safety features does the NRC currently require for facilities that have a credible threat of an earthquake or tsunami? In light of the recent events in Japan, we would also like the NRC to re-examine the assumptions used to determine the maximum credible threat and suggest additional options that could provide a greater margin for safety at plants nationwide that might be subject to challenges similar to this currently being seen in Japan following the earthquake and tsunami.

The NRC requires that each plant be designed to withstand expected ground motion level specific to the site. Our regulations also require designs which consider the potential for a tsunami.

We have also taken advantage of the lessons learned from previous operating experience to implement a program of continuous improvement for the U.S. reactor fleet. This includes a number of new regulatory requirements imposed by the NRC that have enhanced the domestic reactor fleet's preparedness for some of the problems we are seeing in Japan.

The "station blackout" (SBO) rule requires every plant in this country to analyze what the plant response would be if it were to lose all alternating current so that it could respond using batteries for a period of time, and then have procedures in place to restore alternating current to the site and provide cooling to the core. The hydrogen rule requires modifications to reduce the impacts of hydrogen generated in the event of a severe accident and core damage.

With regard to the type of containment design used by the most heavily damaged plants in Japan, the NRC initiated a Boiling Water Reactor (BWR) Mark I Containment Improvement Program in the late 1980. This led to installation of hardened vent systems for containment pressure relief, as well as enhanced reliability of the automatic depressurization system.

Additionally, following the 9/11 events, reactor licensees have been required to develop strategies to maintain and restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with the loss of large areas of the plant due to explosions or fire. Licensees are required to develop strategies for fire fighting, operations to mitigate fuel damage, and actions to minimize radiological release

As a result of the events in Japan, the Chairman, with the full support of the Commission, has directed the NRC staff to establish a senior level agency task force to conduct a methodical and systematic review of our processes and regulations to determine whether the agency should make additional improvements to our regulatory system. This activity will have both near-term and longer-term objectives.

For the near term effort, we have begun a 90-day review. This review will evaluate all of the available information from the Japanese events to identify immediate or near-term operational or regulatory issues potentially affecting the 104 operating reactors in the U.S., including their spent fuel pools. Areas of investigation will include protection against earthquake, tsunami, flooding, hurricanes; station blackout and a degraded ability to restore power; severe accident mitigation; emergency preparedness; and combustible gas control. Over this 90-day period, we will develop recommendations, as appropriate, for changes to inspection procedures and licensing review guidance, and recommend whether generic communications, orders, or other regulatory requirements are needed.

The task force's longer-term review will begin as soon as the NRC has obtained sufficient technical information concerning the events in Japan. The longer term review will evaluate all technical and policy issues related to those events to identify additional potential research, generic issues, changes to the reactor oversight process, rulemakings, and adjustments to the regulatory framework that should be pursued by the NRC. We will also evaluate interagency issues, such as emergency preparedness, and examine the applicability of any lessons learned to non-operating reactors and materials licensees. We expect to seek input from stakeholders during this process. A report with appropriate recommendations will be provided to the Commission within 6 months of the start of this evaluation. Both the 90-day and final reports will be made publicly available.

3. Which U.S. nuclear power plants share similar design features with the affected Japanese reactor facilities? Do these facilities have design vulnerabilities that should be addressed to ensure their cooling systems do not fail when confronted by stresses

including those similar to what we have seen in Japan following the earthquake and tsunami?

Thirty-five of the 104 operating nuclear power plants in the U.S. are BWRs, as are the reactors at Fukushima. Twenty-three of the U.S. BWRs have the same Mark I containment as the Fukushima reactors. Four of the U.S. BWRs are early designs which are similar to Fukushima Unit 1. Nineteen U.S. BWRs are similar to Fukushima Unit 3.

BWR Mark I containments have different designs than other containments. However, the staff does not view the differences in design as vulnerabilities. For example, Mark I designs have relatively small volumes in comparison with most pressurized water reactor (PWR) containments. This makes the BWR Mark I containment relatively more susceptible to containment failure given a core meltdown severe enough to cause the reactor vessel to fail and to breach the containment boundary. On the positive side, BWRs have more ways of adding water to the core than PWRs. This includes the provision of two water injection sources which do not rely on AC electric power. For example these systems include Reactor Core Isolation Cooling (RCIC) and High pressure coolant injection (HPCI).

The NRC initiated a Boiling Water Reactor (BWR) Mark I Containment Improvement Program in the late 1980s. This led to installation of hardened vent systems for containment pressure relief, as well as enhanced reliability of the automatic depressurization system. These changes mitigate the small containment volume of the Mark I design.

The NRC task force will be looking at the sequence of events and status of equipment during the events in Japan and will consider based on our review whether revisions to our regulatory framework are needed..

4. How comprehensive is the radiation monitoring system in Japan? Would the U.S. take a similar monitoring approach if a serious accident were to occur here? What increased risk is associated with exposure to mixed oxide fuel?

The NRC does not currently have sufficient information to describe in detail the radiation monitoring system in Japan. In addition to the radiation monitoring that is required to be performed by all U.S. reactor licensees, the U.S. Environmental Protection Agency conducts environmental monitoring of radiation. Questions concerning the EPA's monitoring systems and actions should be directed to the EPA.

Mixed oxide (MOX) fuel involves the use of plutonium as a fuel, in addition to enriched uranium. Plutonium, like uranium is a long-lived alpha emitter, and they present similar biological risks. All commercial reactors produce plutonium from uranium during operation regardless of whether the material was there to begin with. Regarding exposure to mixed oxide fuel, in Japan, prompt evacuation has minimized radiation exposure to the public, so long-term public health consequences from radiation exposure resulting from the events, whether due to MOX or uranium fuel, are expected to be small. NRC has evaluated the use of MOX fuel and concluded that the design basis accidents consequences were within the acceptance criteria and the differences between MOX and uranium fuel were within the dose consequences calculation uncertainties. The staff has concluded that the presence of a small number of MOX fuel assemblies in Fukushima Daiichi Unit 3 constitutes an insignificant change from non-MOX fuel in core operating conditions and accident consequences.

5. Given what has happened at the Japanese facilities, please describe how the NRC currently ensures the safety of spent fuel pools at U.S. facilities and identify additional steps the NRC could take to better address the vulnerabilities of spent fuel pools at plants in the U.S.

Information concerning the circumstances and specific sequence of events at the Fukushima plants is incomplete at this time, and the lessons to be learned from those events remain to be determined. The NRC's regulatory focus is to ensure that cooling capability, both for reactors and for spent fuel pools, is maintained in order to prevent fuel damage. This has been accomplished at U.S. plants by redundant and/or diverse capabilities to provide forced cooling and water addition

The NRC task force will be looking at a range of issues, including station blackout and severe accident mitigation at spent fuel pools.

6. Has the NRC modeled what could happen if the U.S. had multiple nuclear accidents simultaneously? If so, how would the NRC respond to such a disaster?

In general, the NRC applies the Commission's safety goals on a per-reactor basis. However, in security assessments of two dual-unit sites in the 2002-2004 timeframe, the NRC considered the potential consequences of events simultaneously involving both reactors. The study found that the reactor containments and spent fuel pools are robust structures and resistant to a terrorist attack. The study also found that radiological releases are delayed and smaller than those predicted in past studies. Subsequently, additional mitigation measures were required (10CFR50.44(hh)) to further enhance safety. All U.S. nuclear power plant licensees are required to develop plans to deal with emergencies at their facilities, including the loss of offsite power. In addition, site-specific offsite emergency preparedness plans are required to be developed and exercised on a regular basis, to provide reasonable assurance that adequate protective measures can and will be taken in the event of an emergency. While these capabilities and plans are site-specific, they would apply as well in the event of a broader emergency involving multiple sites.

With regard to the NRC's response to a disaster, the NRC has experience in responding to national events affecting multiple facilities including major hurricanes and regional power blackouts such as the 2003 Northeast blackout. The NRC maintains an emergency operations center that is staffed 24/7. In addition to this emergency response center, the NRC has a backup operations center. Operation of the emergency response centers are tested regularly during facility and national emergency response drills.

Originating Office: EDO
REF: CORR-11-0042
Commission Correspondence

GBJ – Approved/edit
KLS – Approved/edit
GEA – Approved
WDM – Approved/edit
WCO – Approved/edit

ADAMS Accession No.:

OFC	SECY	OCA	OCM/GBJ	OCM/GBJ	
NAME	SMcKelvin		JMonninger	GBJaczko	
DATE	04/08/2011	04/ /2011	04/ /2011	04/ /2011	

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United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, DC 20510-6175

March 17, 2011

The Honorable Gregory Jaczko
Chairman
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Chairman Jaczko:

The loss of life and physical damage that Japan sustained in last week's devastating earthquake and subsequent destructive tsunami is catastrophic and heartbreaking. Our thoughts and prayers, as well as those of the American people, go out to all citizens of Japan and especially to the families of the thousands of disaster victims.

As this tragedy continues to unfold, we encourage the Nuclear Regulatory Commission and other U.S. agencies to continue to coordinate fully with the Japanese government to assess the status of public safety in light of the reactors' failures and to provide all technical assistance required.

The earthquake and tsunami that struck Japan are chilling reminders that we are all vulnerable to unexpected disasters, whether they are an act of nature or a terrorist attack. While we cannot predict with any certainty when or where the next major disaster will occur, we know that adequate preparation and response planning are absolutely vital to minimize injury, death, and destruction when it does happen.

As the Committee with oversight responsibilities on nuclear safety, we believe it is important to assist Japan to ensure that this nuclear disaster is contained as quickly and effectively as possible. For the long term, the multiple simultaneous failures of backup coolant systems at nuclear reactors in Japan are a clear warning that we must step up efforts to ensure that every precaution is taken to safeguard the American people from a similar incident at a U.S. nuclear facility.

Therefore, we call on the NRC to conduct a comprehensive investigation of all nuclear facilities in the United States to assess their capacity to withstand catastrophic natural or man-made disasters including scenarios that may be considered remote like the recent events in Japan. These domestic nuclear reactors must be fully evaluated to ensure that they are as safe and resilient as possible, that worst case scenarios are examined and addressed, and that personnel training and equipment for emergency responses are in place and up-to-date. Special and immediate attention should be given to those U.S. nuclear reactors that share similar characteristics as the failing reactors in Japan, including similar designs or located near a coastline or seismic fault line.

3/17....To EDO to Prepare Response for Chairman's Signature...Date due Comm: April 8....Cpy to: RF, OCA to Ack...11-0126.... COMMISSION CORRESPONDENCE

In addition to updating the EPW Committee on a regular basis, we also request that the NRC supply information to the committee as soon as possible regarding the following issues:

1. Please identify all U.S. nuclear facilities subject to significant seismic activity and/or tsunamis.
2. U.S. nuclear power plants are designed to be safe based on historical data of the area's maximum credible threat (including earthquakes and tsunamis). What extra safety features does the NRC currently require for facilities that have a credible threat of an earthquake and/or tsunami? In light of the recent events in Japan, we would also like the NRC to re-examine the assumptions used to determine the maximum credible threat and suggest additional options that could provide a greater margin for safety at plants nationwide that might be subject to challenges similar to those currently being seen in Japan following the earthquake and tsunami.
3. Which U.S. nuclear power plants share similar design features with the affected Japanese reactor facilities? Do these facilities have design vulnerabilities that should be addressed to ensure their cooling systems do not fail when confronted by stresses including those similar to what we have seen in Japan following the earthquake and tsunami?
4. How comprehensive is the radiation monitoring system in Japan? Would the U.S. take a similar monitoring approach if a serious accident were to occur here? What increased risk is associated with exposure to mixed oxide fuel?
5. Given what has happened at the Japanese facilities, please describe how the NRC currently ensures the safety of spent fuel pools at U.S. facilities and identify additional steps the NRC could take to better address the vulnerabilities of spent fuel pools at plants in the U.S.
6. Has the NRC modeled what could happen if the U.S. had multiple nuclear accidents simultaneously? If so, how would the NRC respond to such a disaster?

Safety is always our number one priority, and therefore it is vital that the NRC immediately evaluate the risks posed to nuclear reactors in the United States. We look forward to working with you to ensure that the nuclear energy industry and NRC regulators are adequately prepared to prevent accidents and to fully address the risks of serious events in the future.

Sincerely yours,

Barbara Boxer

Barbara Boxer
Chairman
Committee on Environment and
Public Works

Thomas R Carper

Tom Carper
Chairman
Subcommittee on Clean Air and
Nuclear Safety

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CHAIRMAN

April 8, 2011

The Honorable Barbara Boxer
Chairman, Committee on Environment
and Public Works
United States Senate
Washington, D.C. 20510

Dear Madam Chairman:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter of March 16, 2011. In light of the recent events in Japan, you asked that we perform a thorough review of the Diablo Canyon and San Onofre nuclear power plants and posed a number of questions. Detailed responses to the questions contained in your letter are provided in the enclosure.

Regarding a review of the California facilities, the Commission directed the NRC staff to establish a senior level agency task force to conduct a methodical and systematic review of our processes and regulations to make recommendations to the Commission whether the agency should make additional improvements to our regulatory system. This review will include an assessment of any regulatory issues in the areas of earthquakes and emergency preparedness mentioned in your letter. This activity will have both near-term and longer-term objectives. We are also pursuing limited actions that appear to be prudent, including inspection activities to look at the readiness of plants to deal with both design basis and beyond design basis accidents. We will keep you and our other stakeholders informed as we proceed.

While the NRC continues to provide assistance to the Japanese government, I want to assure you that the NRC continues to make its domestic responsibilities for licensing and oversight of the U.S. licensees its top priority and that the U.S. nuclear power plants continue to operate safely. With the near-term evaluation of the relevance of recent events to the U.S. fleet underway, the NRC is continuing to gather the information needed for us to take a longer, more thorough look at the events in Japan and their lessons for the NRC. Based on these efforts, the agency will take all appropriate actions necessary to ensure the continuing safety of the American public.

Sincerely,

Gregory B. Jaczko

Gregory B. Jaczko

Enclosure: As stated

JJJ | 280

Identical letter sent to:

The Honorable Barbara Boxer
Chairman, Committee on Environment
and Public Works
United States Senate
Washington, D.C. 20510

The Honorable Dianne Feinstein
United States Senate
Washington, D.C. 20510

Responses to Questions from Senator Barbara Boxer and Senator Dianne Feinstein Letter of March 16, 2011

Plant Design and Operations

1. **What changes to the design or operation of these facilities have improved safety at the plants since they began operating in the mid-1980s?**

We have taken advantage of the lessons learned from previous operating experience to implement a program of continuous improvement for the U.S. reactor fleet. We have learned from experience across a wide range of situations, including, most significantly, the Three Mile Island accident in 1979. As a result of those lessons learned, we significantly revised emergency planning requirements and emergency operating procedures for licensees, and made substantive improvements in NRC's incident response capabilities. We also addressed many human factors issues regarding control room indicators and layouts, added new requirements for hydrogen control to help prevent explosions inside of containment, and created requirements for enhanced control room displays of the status of pumps and valves.

Two significant changes after Three Mile Island (TMI) were the expansion of the Resident Inspector Program and the incident response program. Today, there are at least two Resident Inspectors at each nuclear power plant. The inspectors have unfettered access to all licensees' activities, and serve as NRC's eyes and ears at the power plant. The NRC Headquarters Operations Center and regional incident response centers are prepared to respond to all emergencies, including any resulting from operational events, security events, or natural phenomena. Multidisciplinary teams in these centers have access to detailed information regarding licensee facilities, and access to plant status information through telephonic links with the Resident Inspectors, an automated emergency response data system, and directly from the licensee through the emergency notification system. In the case of a significant event the NRC's response would include the dispatch of a site team to augment the Resident Inspectors on site, and integration with the licensee's emergency response organization at its Emergency Offsite Facility. The NRC's incident response program is designed to provide an independent assessment of events, to ensure that appropriate actions are taken to mitigate the events, and to ensure that State officials have the information they would need to make decisions regarding protective actions.

Further, a number of new regulatory requirements were imposed by the NRC following the TMI accident, which enhanced the domestic fleet's preparedness to cope with some of the problems have seen seeing in Japan. For example, the "station blackout" rule requires every plant in this country to analyze what the plant response would be if it were to lose all alternating current so that it could respond using batteries for a period of time, and then have procedures in place to restore alternating current to the site and provide cooling to the core.

Another post-TMI requirement, the hydrogen rule, required modifications to reduce the impacts of hydrogen generated for beyond-design basis events and core damage. In addition, there are equipment qualification rules that require equipment, including pumps and valves, to remain operable under the kinds of environmental temperature and radiation conditions that you would see in a beyond-design basis accident. With regard to the type of containment design used by the most heavily damaged plants in Japan, the NRC implemented a Boiling Water Reactor Mark I Containment Improvement Program. This program led to installation of hardened vent systems for containment pressure relief, as well as enhanced reliability of the automatic depressurization system.

Emergency planning and preparedness was also augmented substantially following the TMI accident, with the adoption of additional regulatory requirements and the conduct of mandatory emergency planning exercises on a biennial basis, including participation by state and local government officials. The NRC's emergency preparedness and planning requirements provide ongoing training, testing, and evaluations of licensees' emergency preparedness programs. In coordination with our federal partner, the Federal Emergency Management Administration (FEMA), these activities include extensive interaction with state and local governments, as those programs are coordinated with state and local officials and are evaluated and tested on a periodic basis.

As a result of the events of September 11, 2001, we identified important pieces of equipment that, regardless of the cause of a significant fire or explosion at a plant, licensees have available and staged in advance, as well as new procedures, training requirements, and policies that would help deal with a severe situation.

Since Diablo Canyon went into commercial service, many specific changes in design or operation have been implemented at the plant. These include the following:

- Added sixth on-site emergency diesel generator
- Increased volume of diesel generator fuel oil tanks to supply 7 days of fuel
- Added capacitor banks to the 230 kV offsite power source to improve reliability of offsite power source
- Replaced 500 kV offsite power source circuit breakers with new design that has increased earthquake resistance
- Replaced offsite power source transformers
- Replaced the reactor heads for the reactor vessels with a new design that has improved resistance to corrosion
- Replaced steam generators with new design that has improved resistance to corrosion
- Increased the capacity of the 4 kilovolt system circuit breakers
- Replaced plant process computer
- Replaced low pressure turbine rotors with a new design that is more resistant to turbine blade failure

- Replaced the water cooled positive displacement pumps for core injection with air cooled centrifugal charging pumps
- Replaced main feedwater pump control system to digital based control system
- Upgraded residual heat removal system piping to reduce potential flow induced erosion following an accident
- Replaced emergency core cooling system flow orifices to reduce potential potential flow blockage following an accident
- Replaced the containment sump strainer with a new design that is five times larger to minimize susceptibility to clogging
- Removed material from inside containment that could become a potential debris source following a loss of coolant accident
- Developed additional procedures to address potential natural and manmade disasters
- Implemented significant site changes to improve plant security
- Implemented procedures and training to improve human performance and reduce errors
- Implemented procedures and training to increase use of industry nuclear plant operating experience to improve plant safety

Changes in design or operation at San Onofre (SONGS) have included the following:

- Replaced steam generators with new design that has improved resistance to corrosion
- Developed additional procedures to address potential natural and manmade disasters
- Replaced the containment sump strainer with a new design that is five times larger to minimize susceptibility to clogging
- Removed material from inside containment that could become a potential debris source following a loss of coolant accident
- Implemented significant site changes to improve plant security
- Implemented procedures and training to improve human performance and reduce errors
- Implemented procedures and training to increase use of industry nuclear plant operating experience to improve plant safety
- Replaced all Emergency Planning Zone alert notification sirens in 2005 and 2006, and added paging capability.
- Replaced plant process computer
- Replaced low pressure turbine rotors with new design that is more resistant to turbine blade failure and stress corrosion cracking
- Replaced main feedwater pump control system to digital based control system
- Replaced service air compressors with modern model, and add cross-tie to instrument air
- Added vent to HPSI line to ensure ECCS system free of gas

- Increased safety related battery capacity (1200-1800 amp hours)
- Added degraded grid undervoltage relays to 1E 4KV buses
- Added a portable generator for steam generator water level indication in order to facilitate steam driven pump manual operation during beyond design basis blackout scenarios

2. **What emergency notification systems have been installed at California nuclear power plants? Has there ever been a lapse of these systems during previous earthquakes or emergencies?**

An Early Warning System (EWS) is installed to provide prompt alerting of the public in the event of an emergency at both Diablo Canyon and SONGS. The EWS consists of 131 sirens positioned out to 22 miles from the plant at Diablo Canyon, and 50 sirens spanning 10 miles at SONGS. The EWS is used in conjunction with radio and TV broadcasts, and allows instructions, information, and necessary actions to be immediately communicated to the public. The sirens are equipped with battery or solar-powered back-up capability. This redundancy in power source was upgraded in the 2005-2006 timeframe. The sirens are tested daily, bi-weekly, quarterly, and annually. The sirens are monitored 24/7 with alarms for system failures.

For Diablo Canyon, prior to installing the power-back up capability, some sirens lost power during the December 2003 San Simeon earthquake. The sirens were not used during that earthquake but back-up route alerting was set up if the need for public alerting warranted. The SONGS EWS sirens have not been affected by past seismic activity.

3. **What safety measures are in place to ensure continued power to California reactors in the event of an extended power failure?**

U.S. plants are required to meet 10 CFR Part 50 Appendix A General Design Criterion 17, "Electric Power System." Reactor units must have two physically independent offsite power supplies capable of placing the units in a safe shutdown condition. Additionally, all plants are required to have onsite power supplies that are also independent and capable of placing the units in a safe shutdown condition assuming a worst case single failure. All U.S. plants (except Oconee which has an alternate system) have emergency diesel generators and battery backup systems. Most U.S. plants with diesels have two diesels per unit (Diablo Canyon has 3). The regulations do not specify the length of time that the diesels and batteries must be able to operate following a loss of offsite power. The required amount of time is dependent on the plant's site recovery strategy and is based on providing sufficient capacity to assure that the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

If Diablo Canyon experiences a loss of power from the 500 kV and 230 kV offsite power switchyards, three emergency diesel generators (EDGs) are available to supply onsite power in each of the units. A unit can be safely shutdown utilizing any single

EDG. There are two-50,000 gallon diesel fuel oil tanks, sufficient to operate an EDG for seven days. The EDGs are located at an elevation of 85 feet, well above the maximum expected tsunami elevation.

In addition, Emergency Operating Procedures (EOPs) are in place that include procedures to cope with the loss of all vital AC power. For example, there are Casualty Procedures in place that have pre-planned actions in the event of earthquakes, tsunami warnings and fires. There are Severe Accident Management Guidelines in place that contain actions to take in extreme conditions that require coolant injection to the reactor core, mitigation of hydrogen flammability in containment, and coolant to flood-up containment and cover the reactor core. There are Extreme Damage Mitigation Guidelines (EDMGs) in place that postulate extensive plant damage due to a natural disaster or terrorist event. The EDMGs are invoked when the control of the plant cannot be established from the Main Control Room or there is no communication with the Main Control Room. The Extreme Damage event is assumed to disable all electric power. The EDMGs provide a procedure to perform multiple actions (if needed) to continue to cool the reactor core, cool the spent fuel pool, and minimize radiation release.

SONGS is similar to Diablo Canyon with 2 EDGs per unit and the EDGs are located 30 feet above sea level. SONGS also has a physical cross-tie ability such that the EDGs on one unit can be used to safely shutdown the other unit in the event that either unit loses both of its EDGs. The comments provided above concerning emergency procedure improvements at Diablo Canyon (i.e., EOPs, Severe Accident Mitigation Guidelines, and EDMGs) apply as well to SONGS.

Type of Reactor

1. **What are the differences and similarities between the reactors being used in California (pressurized water reactors) and those in Japan (boiling water reactors), as well as the facilities used to house the reactors, including the standards to which they were built and their ability to withstand natural and manmade disasters?**

   The two types of light-water reactors in operation in the United States are pressurized (PWR) and boiling (BWR) water reactors. The PWRs use a two-stage system where the water in the reactor is maintained at a high pressure, and an additional coolant loop is used to transfer heat from that system to produce steam to drive the turbines, while BWRs use a single-stage system that allows water in the reactor to boil to produce steam to drive the turbines directly. The NRC is not yet fully aware of all of the attributes of the specific BWR reactors in question in Japan and how they are different from or similar to BWRs or other reactors in operation in the U.S. Many changes have been made over the years in the design and operation of U.S. nuclear power plants through our program of safety improvement (as described in our response to Question #1 above), which may or may not have been made to reactors operating in Japan.

We have, since the beginning of the regulatory program in the United States, used a philosophy of Defense-in-Depth, which recognizes that nuclear reactors require the highest standards of design, construction, operation, and oversight, and does not rely on any single layer to protect public health and safety. We begin with designs for every individual reactor that take into account site-specific factors and include a detailed evaluation for any credible natural event, such as earthquakes, tornadoes, hurricanes, floods, and tsunamis, as they relate to that site. There are multiple physical barriers to the release of radiation in every reactor design. Additionally, there are both diverse and redundant safety systems that are required to be maintained in operable condition and are frequently tested to ensure that the plant is in a high condition of readiness to respond to any scenario.

Looking at basic design differences between the Japanese BWRs and the California plants, the following can be noted:

- The Japanese reactors have containments that are part of the reactor design and the buildings in which they are placed are not containment structures. By contrast, the California reactors have significantly larger volume containment buildings that house the reactors. This reduces the chance of exceeding the containment design pressure or having a hydrogen explosion inside containment following a natural or manmade disaster that can result in a release of radioactive material to the environment.
- In the event of the loss of power at a U.S. PWR, the reactor core can be cooled using natural circulation of water (without pumps) in the primary coolant loop to transfer heat from the reactor core to the secondary loop. The secondary loop in a PWR can be used to remove the primary loop heat (without power) by pumping non-radioactive water in the secondary loop into heat exchangers (steam generators) with a steam driven pump and releasing non-radioactive steam to the atmosphere via manually operated valves or spring operated safety relief valves. By contrast, venting steam from the Japanese BWRs resulted in a release of radiation to the reactor building from which it escaped to the environment. In addition, there are multiple other pre-planned methods available to provide on-site stored water to the reactor core and to the steam generators to ensure continued core cooling after a disaster.
- The spent fuel pool at a U.S. PWR is contained in a separate building, instead of being contained above the primary containment structure as in a Japanese BWR.
- There are multiple on-site stored water sources and pre-planned measures in place to provide water to the spent fuel pools.

<u>Earthquakes and Tsunamis</u>

1. **We have been told that both Diablo Canyon and San Onofre Nuclear Generating Station are designed to withstand the maximum credible threat at both plants, which we understand to be much less than the 9.0 earthquake that hit Japan. What assumptions have you made about the ability of both plants to withstand an**

earthquake or tsunami? Given the disaster in Japan, what are our options to provide these plants with a greater margin for safety?

All U.S. nuclear power plants are built to withstand external hazards, including earthquakes, flooding, and tsunamis, as appropriate. Regarding earthquakes, nuclear plants, are designed based on ground motion levels, not earthquake magnitudes. Ground motion is a function of both the magnitude of an earthquake and the distance from the fault to the site. The existing nuclear plants in the U.S. were designed based on a "deterministic" or "scenario earthquake" basis that accounted for the largest earthquakes that could reasonably be expected in the area around the plant. A margin is further added to the predicted ground motions to provide added robustness. The NRC's Generic Issue 199 (GI-199) project is using the latest probabilistic techniques used for new nuclear plants to review the safety of existing plants.

Both Diablo Canyon and SONGS are known to have a tsunami hazard. As such, they are designed to withstand the maximum predicted tsunami with coincident wave action.

It is too early to tell what the lessons from this earthquake are. The NRC will look closely at all aspects of the plants' response to the earthquake and tsunami to determine if any actions need to be taken in U.S. nuclear plants and if any changes are necessary to NRC regulations.

2. **Have new faults been discovered near Diablo Canyon or San Onofre Nuclear Generating Station since those plants began operations? If so, how have the plants been modified to account for the increased risk of an earthquake? How will the NRC consider information on ways to address risks posed by faults near these plants that is produced pursuant to state law or recommendations by state agencies during the NRC relicensing process?**

A new Shoreline fault zone near Diablo Canyon was discovered in late 2008. In 2009 and 2010 Pacific Gas and Electric (PG&E) acquired, analyzed, and interpreted new data to better assess the seismic hazard from the Shoreline fault zone. PG&E submitted the final Shoreline fault zone report to the NRC on January 7, 2011. PG&E has concluded that maximum ground motions at the site from local faults are bounded by ground motions for which the plant had been previously evaluated. PG&E has also stated that the tsunami hazard threat from the Shoreline fault zone is relatively small since it is a strike-slip fault rather than a reverse fault and, therefore, the tsunami hazard is not expected to exceed the plant's design-basis tsunami characteristics.

The NRC staff is evaluating the tsunami hazard and is conducting an independent deterministic seismic hazard analysis of the Shoreline fault based on the information provided by the licensee to confirm the licensee's conclusions regarding the safe operation of the plant. In this regard, the staff has reviewed interim seismic studies related to the Shoreline fault zone. The staff is also in the process of reviewing PG&E's final Shoreline fault zone report to determine whether any licensee or regulatory action may be needed. In addition to these specific efforts, the staff plans to continue discussions with PG&E on a possible license amendment to codify a Long Term Seismic Program methodology for the management of new geotechnical seismic information.

For SONGS, no new active faults have been discovered.

With regard to studies performed by other entities, such as the State of California, the NRC reviews each study's results for any new information and design challenges. The State of California is funding a new seismic study that is currently in the planning and draft phase. Licensees are required through their Technical Specifications to notify the NRC at any time during a review or study should evidence of a design challenge be identified.

The NRC considers seismic hazards to be an ongoing regulatory concern; therefore, we address seismic hazards as part of our reactor oversight process for operating reactors whenever a significant change is recognized. As a result, the NRC does not separately re-analyze seismic hazards for the license renewal process. The license renewal review is focused on managing the effects of aging and not a re-review of the current licensing basis.

3. **What are the evacuation plans for both plants in the event of an emergency? We understand that Highway 1 is the main route out of San Luis Obispo, what is the plan for evacuation of the nearby population if an earthquake takes out portions of the highway and a nuclear emergency occurs simultaneously?**

Each U.S. nuclear power plant has an emergency plan for ensuring the health and safety of members of the public who live within the emergency planning zone. Emergency plans contain contingencies for alternate evacuation routes, alternate means of notification, and other backup plans in the event of a natural disaster that damages the surrounding infrastructure.

FEMA reviews off-site emergency plans formally every 2 years during a biennial emergency preparedness exercise. The NRC evaluates on-site emergency plans during the same exercise, as well as on an annual basis. Population studies are conducted every 10 years, and evacuation time estimates are re-evaluated at that time. FEMA reviews the offsite emergency plans and evacuation time estimates, and determines whether there is a reasonable assurance that adequate protective measures can and will be taken in the event of an emergency at a nuclear power plant.

Evacuation of members of the general public is the responsibility of San Luis Obispo County for Diablo Canyon and San Diego County for SONGS, working in conjunction with the State of California, and would be carried out in accordance with their prearranged plans. The areas to be evacuated and specific evacuation routes would depend on the meteorological conditions and route viability at the time of the accident. PG&E and Southern California Edison (SCE) would act in an advisory capacity, giving technical assessments of the conditions at the plants and the probabilities for a potential off-site release as well as other pertinent information. This information, along with the licensee's recommended protective actions, would be assessed by responsible county and state officials in determining appropriate actions to be taken.

For Incidents of National Significance where the critical infrastructure is severely damaged, DHS has a lead role as a coordinating agency to orchestrate Federal, State, and local assets. The Nuclear/Radiological Incident Annex to the National Response Framework provides for the NRC to be a coordinating agency for incidents involving NRC-licensed materials.

The main route out of San Luis Obispo is Highway 101. The main route for SONGS is Highway 5. For both sites, evacuation studies are conducted by demography specialists and provide information on various evacuation scenarios that could take place. The studies' results consider normal road conditions, time of day, degraded weather/visibility, and road condition.

4. **What is the NRC's role in monitoring radiation in the event of a nuclear accident both here and abroad? What is the role of EPA and other federal agencies?**

A number of U.S. agencies are involved in domestic monitoring and radiation assessment, including the EPA, Department of Energy, and NRC. NRC regulations require nuclear power plants to report any radiation levels detected at the plant that could be harmful to the public. This would include radiation levels generated by the plant or by an external source. EPA and DOE are responsible for more comprehensive domestic radiation monitoring.

The EPA utilizes its existing nationwide radiation monitoring system, RadNet, to continuously monitor the nation's air, and it regularly monitors drinking water, milk, and precipitation for environmental radiation.

5. **What monitoring systems currently are in place to track potential impacts on the U.S., including California, associated with the events in Japan?**

See response to Question #4 above. All U.S. plants are required to have a Radiological Environmental Monitoring Program (REMP) in the surrounding communities that are monitored at specific intervals and analyzed in a laboratory as part of a normal offsite monitoring and sampling program.

In addition, Diablo Canyon and SONGS have near-site radiation monitoring systems in place utilizing pressurized ion chambers (radiation detectors). The facilities' pressurized ion chambers are owned and operated by the EPA and are a part of the RadNet system. The EPA monitors the real-time data from these monitors on a continuous basis. The EPA is able to share their data with other agencies during emergency situations. Questions regarding the details of specific monitoring systems of EPA and other federal agencies should be directed to those agencies.

6. **Which federal agency is leading the monitoring effort and which agencies have responsibility for assessing human health impacts? What impacts have occurred to date on the health or environment of the U.S. or are currently projected or modeled in connection with the events in Japan?**

   See response to Question #4 above. The EPA, working with the NRC, DOE and others, has the lead for radiation monitoring activities and regularly samples air, water, and milk. An interagency advisory team that includes the NRC, the Departments of Energy, Health and Human Services, Agriculture, and others, has been established under EPA's leadership and is regularly evaluating potential health and environmental impacts from events in Japan.

   Only trace amounts of radioactive material have been identified through U.S. monitoring; those trace amounts are far below levels of natural background radiation and are not of public health concern. The NRC does not expect any U.S. states or territories to experience harmful levels of radioactivity as a result of the events in Japan.

7. **What contingency plans are in place to ensure that the American public is notified in the event that hazardous materials associated with the events in Japan pose an imminent threat to the U.S.?**

   Under the Nuclear/Radiological Incident Annex to the National Response Framework, the U.S. EPA is the federal lead for plumes that come across our borders. In such situations, EPA would proceed in accordance with its established processes and procedures to work with state and local governments to protect public health and safety.

   If an event requiring protective measures were to occur, U.S. residents would be advised to listen to their state and county authorities who are responsible for making protective action decisions for public health and safety. If necessary and, as appropriate, protective action decisions could include: preventing contaminated food from reaching the marketplace, recommending that all local produce be thoroughly rinsed prior to consumption, or sheltering or evacuating affected citizens. The NRC will continue to work with its local, state, and federal partners to ensure that appropriate emergency response procedures are prepared, reviewed, and exercised in accordance with NRC regulations.

Originating Office: EDO
REF: CORR-11-0041
Commission Correspondence

GBJ – Approved/edit
KLS – Approved/edit
GEA – Approved/edit
WDM – Approved/edit
WCO – Approved/edit

ADAMS Accession No.:

OFC	SECY	OCA	OCM/GBJ	OCM/GBJ	
NAME	SMcKelvin		JMonninger	GBJaczko	
DATE	04/08/2011	04/ /2011	04/ /2011	04/ /2011	

OFFICIAL RECORD COPY

United States Senate
WASHINGTON, DC 20510

March 16, 2011

The Honorable Gregory Jaczko
Chairman
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Chairman Jaczko:

The unfolding nuclear disaster in Japan has raised questions about the safety of nuclear power plants here in the U.S. As Senators from California, we are particularly interested in the safety of San Onofre Nuclear Generating Station, located in San Clemente, and the Diablo Canyon Nuclear Power Plant near San Luis Obispo, both of which are near earthquake faults.

Roughly 424,000 live within 50 miles of the Diablo Canyon and 7.4 million live within 50 miles of San Onofre Nuclear Generating Station. Although many safety measures have been taken to address potential hazards associated with these facilities, we need to ensure that the risk is fully evaluated.

For example, a 2008 California Energy Commission report presented very clear warnings of potential threats at both of these plants. This report found that the San Onofre plant could experience "larger and more frequent earthquakes" than the maximum 7.0 magnitude earthquake predicted when the plant was designed. It is our understanding that the NRC has not taken action to address these warnings in the report. It is also our understanding that the 2008 report found that there is an additional fault near the Diablo Canyon plant that should be taken into consideration as part of NRC's relicensing process. We want to know if the NRC will address all of the threats, including seismic threats, described in the 2008 report at these facilities.

We ask that the Nuclear Regulatory Commission (NRC) perform a thorough inspection at these two plants to evaluate their safety and emergency preparedness plans.

3/17....To EDO to Prepare Response for Chairman's Signature....Date due Comm: April 8...Cpy to: RF, OCA to Ack....11-0127 COMMISSION CORRESPONDENCE

In addition, we ask the NRC to answer the questions below regarding plant design and operations, type of reactor, and preparedness to withstand an earthquake or tsunami and other potential threats.

Plant Design and Operations

1. What changes to the design or operation of these facilities have improved safety at the plants since they began operating in the mid-1980s?

2. What emergency notification systems have been installed at California nuclear power plants? Has there ever been a lapse of these systems during previous earthquakes or emergencies?

3. What safety measures are in place to ensure continued power to California reactors in the event of an extended power failure?

Type of Reactor

1. What are the differences and similarities between the reactors being used in California (pressurized water reactors) and those in Japan (boiling water reactors), as well as the facilities used to house the reactors, including the standards to which they were built and their ability to withstand natural and manmade disasters?

Earthquakes and Tsunamis

1. We have been told that both Diablo Canyon and San Onofre Nuclear Generating Station are designed to withstand the maximum credible threat at both plants, which we understand to be much less than the 9.0 earthquake that hit Japan. What assumptions have you made about the ability of both plants to withstand an earthquake or tsunami? Given the disaster in Japan, what are our options to provide these plants with a greater margin for safety?

2. Have new faults been discovered near Diablo Canyon or San Onofre Nuclear Generating Station since those plants began operations? If so, how have the plants been modified to account for the increased risk of an earthquake? How will the NRC consider information on ways to address risks posed by faults near these plants that is produced pursuant to state law or recommendations by state agencies during the NRC relicensing process?

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4. What is the NRC's role in monitoring radiation in the event of a nuclear accident both here and abroad? What is the role of EPA and other federal agencies?

5. What monitoring systems currently are in place to track potential impacts on the U.S., including California, associated with the events in Japan?

6. Which federal agency is leading the monitoring effort and which agencies have responsibility for assessing human health impacts? What impacts have occurred to date on the health or environment of the U.S. or are currently projected or modeled in connection with the events in Japan?

7. What contingency plans are in place to ensure that the American public is notified in the event that hazardous materials associated with the events in Japan pose an imminent threat to the U.S.?

The NRC was created in the mid-1970s specifically to ensure the protection of public health and safety with regard to civilian nuclear power. The Commission plays an essential role ensuring that we learn from nuclear accidents and near misses. We hope you agree that we must identify whatever lessons are to be learned from the disaster in Japan in order to make facilities in the United States as safe as possible.

We look forward to working with you to ensure the safety of our nation's nuclear power plants and to make the changes necessary to ensure a nuclear tragedy does not occur in this country.

Sincerely,

Barbara Boxer

Dianne Feinstein

From: ET02 Hoc
Sent: Friday, April 08, 2011 5:46 AM
To: ET07 Hoc
Subject: FW: NRC's Daily Assessment of Conditions at Fukushima Daiichi
Attachments: NRC Daily Assessment of Daiichi - 4-8-11.pdf

From: ET01 Hoc
Sent: Friday, April 08, 2011 5:45:59 AM
To: ET02 Hoc
Subject: FW: NRC's Daily Assessment of Conditions at Fukushima Daiichi
Auto forwarded by a Rule

From: Weber, Michael
Sent: Friday, April 08, 2011 5:45:57 AM
To: Johnson, Michael; ET01 Hoc; ET05 Hoc; OST02 HOC; RST01 Hoc
Subject: FYI - NRC's Daily Assessment of Conditions at Fukushima Daiichi
Auto forwarded by a Rule

From: Salay, Michael
To: Jaczko, Gregory
Cc: Borchardt, Bill; Weber, Michael; Virgilio, Martin; Casto, Chuck; Leeds, Eric; RST01 Hoc
Sent: Fri Apr 08 04:28:17 2011
Subject: NRC's Daily Assessment of Conditions at Fukushima Daiichi

Dear Chairman,

Attached please find the NRC Japan Team's Daily Assessment of conditions at the Fukushima Daiichi nuclear power plants and spent fuel pools. There are two changes of note for today. Following the earthquake last night the unit 1 feedwater nozzle temperature and drywell radiation monitors indicated higher levels. This is reflected by a down arrow in the attached for cooling of the Unit 1 Vessel. The injection flow rate to the Unit 2 reactor vessel was reduced from 8 cubic meters per hour to 7 cubic meters per hour. This is reflected by a down arrow in the attached for cooling of the Unit 2 Vessel. We will continue to discuss these issues with NISA and TEPCO.

If you have any questions, please don't hesitate to ask.

Best regards,
Mike Salay
NRC Japan Team

JJJ | 281

NRC's Daily Assessment of Conditions at Fukushima Daiichi Nuclear Power Plant

Unit 1		Today	Yesterday
Vessel	Cooling	Challenged ↓	Challenged ↓
	Integrity	Intact ↔	Intact ↔
Containment	Flooding	Inc./Needed ↔	Inc./Needed ↔
	Integrity	Challenged ↔	Challenged ↔
Spent Fuel Pool	Cooling/Level	Adequate ↔	Adequate ↔
	Integrity	Intact ↔	Intact ↔

Unit 2		Today	Yesterday
Vessel	Cooling	Challenged ↓	Challenged ↔
	Integrity	Failed ↔	Failed ↔
Containment	Flooding	Inc./Needed ↔	Inc./Needed ↔
	Integrity	Failed ↔	Failed ↔
Spent Fuel Pool	Cooling/Level	Adequate ↔	Adequate ↔
	Integrity	Intact ↔	Intact ↔

Unit 3		Today	Yesterday
Vessel	Cooling	Adequate ↔	Adequate ↔
	Integrity	Failed ↔	Failed ↔
Containment	Flooding	Challenged ↔	Challenged ↔
	Integrity	Failed ↔	Failed ↔
Spent Fuel Pool	Cooling/Level	Challenged ↔	Challenged ↔
	Integrity	Challenged ↔	Challenged ↔

Unit 4		Today	Yesterday
Spent Fuel Pool	Cooling/Level	Challenged ↔	Challenged ↔
	Integrity	Failed ↔	Failed ↔

		Today	Yesterday
Protective Measures	Exposure Risk	Low ↔	Low ↔

April 8, 2011

Methodology for Developing the Fukushima Daiichi Daily Assessment Report

PURPOSE: The report is prepared to provide a qualitative high level assessment of daily conditions at Fukushima Daiichi that the U.S. Ambassador can use to assess the safety of American citizens in Japan.

DISCLAIMER: The development of the daily assessment report includes a number of inputs. Some of these are objective, such as plant data provided by TEPCO, while others are subjective, such as engineering insights from the NRC's reactor and protective measures specialists in Japan. It should be recognized that there are many unknowns and uncertainties associated with having a complete understanding of conditions in each of the Daiichi reactors and spent fuel pools. As such, this tool represents the collective judgment of the NRC staff in Japan based on all available data.

For each of the major plant parameters listed below, the NRC staff assesses its status daily and bins it into one of the three categories listed. The staff uses the listed plant information and conditions in making its assessment. The arrows on the report indicate the relative trend in plant conditions from the previous day.

1. Reactor Pressure Vessel
    a. Cooling – Adequate, Challenged, or Inadequate.
        i. Flow or Injection Rate
        ii. Reliability of Injection
        iii. Source of Water
    b. Integrity – Intact, Challenged, or Failed.
        i. Temperature indications
        ii. Pressure readings
2. Primary Containment
    a. Flooding Status – Complete/Not needed, Challenged, or Incomplete/Needed.
        i. Water Level
        ii. Sources
        iii. Injection capacity/rate
    b. Integrity - Intact, Challenged, or Failed.
        i. Pressure readings
        ii. Bypass evaluations
        iii. Temperature indications
3. Spent Fuel Pools
    a. Cooling/Level – Adequate, Challenged, or Inadequate.
        i. Flow or Injection Rate
        ii. Reliability of Injection
        iii. Source of Water
    b. Integrity – Intact, Challenged, or Failed. Due to limited available data, this assessment relies strongly on the NRC team's engineering judgment.
4. Protective Measures – Exposure Risk to American citizens in Japan outside the U.S. government's recommended 50-mile evacuation zone.
    a. Low – 50-mile recommendation remains sufficient
    b. Medium – New information has raised questions regarding the sufficiency of the 50-mile recommendation.
    c. High – 50-mile recommendation is no longer sufficient due to changing plant condition

From: HOO Hoc
Sent: Friday, April 08, 2011 9:45 AM
To: LIA07 Hoc; OST01 HOC; OST02 HOC; OST03 HOC; PMT01 Hoc; PMT02 Hoc; PMT03 Hoc; PMT04 Hoc; PMT05 Hoc; PMT08 Hoc; PMT07 Hoc; PMT09 Hoc; PMT10 Hoc; PMT11 Hoc
Subject: FW: Fax from 81355105111
Attachments: File1.PDF

-----Original Message-----
From: hoo1 [mailto:hoo1.hoc@nrc.gov]
Sent: Friday, April 08, 2011 9:33 AM
To: HOO Hoc
Subject: Fax from 81355105111

RECEIVE NOTIFICATION FOR JOB 00018112

Notice for: HOO1

Remote ID: 81355105111

Received at: 04/08/2011 09:32

Pages: 4

Routed by:

Routed at: 04/08/2011 09:32

JJJ|282

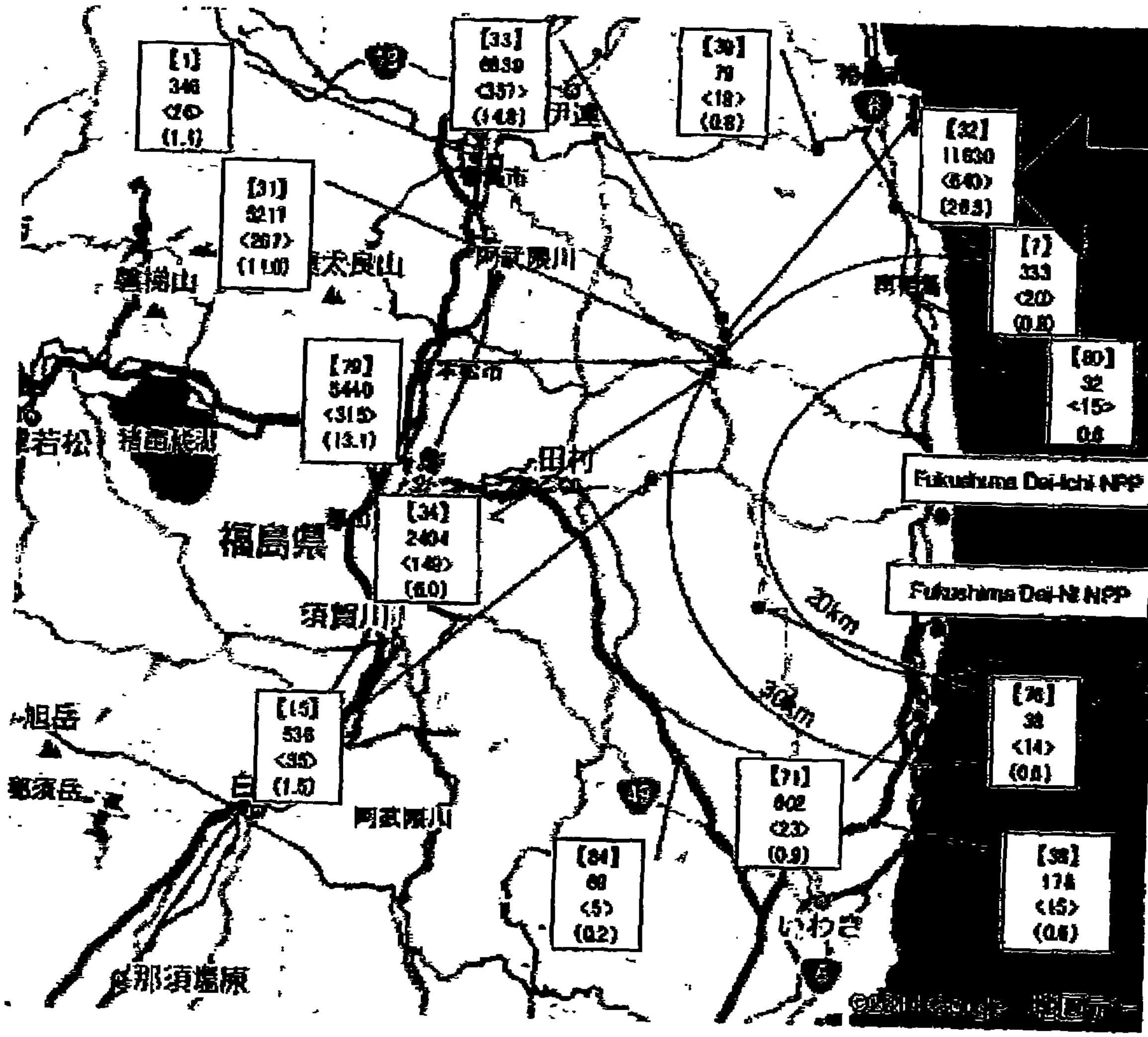
Copy to PMT

Please send to the Chairman and Marty [illegible]

— C [illegible]

MEXT: Radiation Dose at 30 Km

Readings of Integrated Dose at Monitoring Post out of Fukushima Dai-ichi NPP



Monitoring Time

- March 23th~April 5th (Monitoring Post:7、31~34、79)
- March 23th~28th、April 3rd~4th ([illegible]oring Post:71)
- [illegible] 24th~April 5rd (Monitoring Post:1、15)
- March 25th~April 1st、April 3rd~5th (Monitoring Post:84)
- March 31th~April 1st、April 3rd~5th (Monitoring Post:38)
- April 1st~April 5th (Monitoring Post:39)
- April 2nd~April 5th (Monitoring Post:76)
- April 3th~April 5th (Monitoring Post:80)

● Monitoring Post

(explanatory note)

【Monitoring Post number】
Readings of Integrated Dose ※
<increment from the last monitoring>
(average dose per hour)

Readings of Integrated Dose indicate that accumulation of dose from each starting date till April 2nd, for 1 day to 10days.

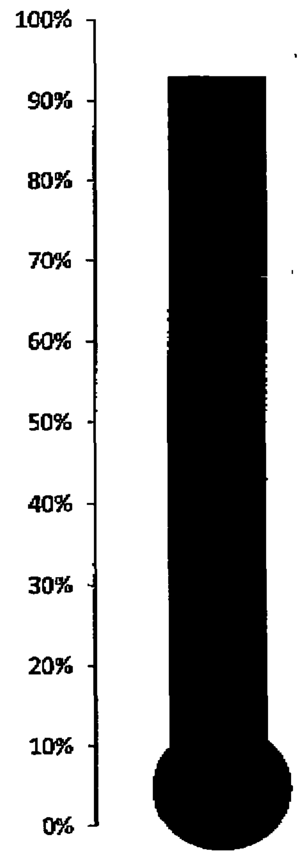
Unit: μSv per hour

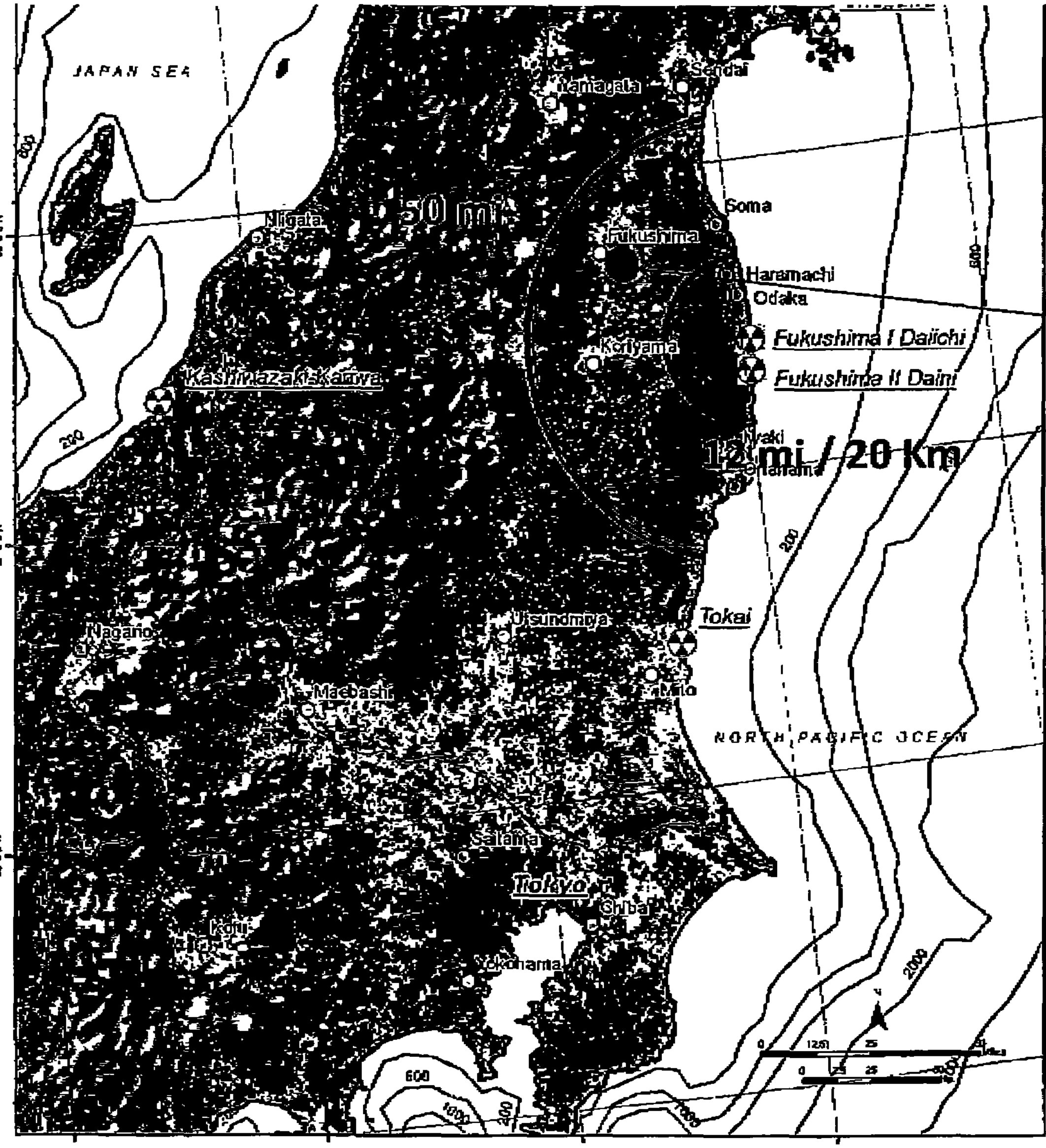
Radiation Dose at 30 Km

MP 32 Mar 23-Apr 5, 2011

Standard	Accumulated Dose (μSv)	Comment
ATSDR Min Risk Level (1 yr exposure)	1000	Exceeded
OSHA Limit General Public 1 Yr Exposure	1000	Exceeded
ATSDR Min Risk Level (14-Day Exposure)	4000	Exceeded
OSHA Limit Pregnant Worker 1 Yr Exposure	5000	Exceeded
MP 32 (NW side of 30 km radius)	**11630**	**Detected**
OSHA 90-day Limit Radiation Worker	12500	93%
OSHA Annual Limit Radiation Worker	50000	Annual Limit

OSHA 90-Day Exposure Limit (At 93% of Limit in 14 Days)





Evacuation Radii

MP 32

The U.S. 50-mile radius adequately protects public health, but the Japanese 20-kilometer (12 mile) radius may not protect the health of the general public, pregnant female radiation workers, or radiation workers who remain longer than 2 weeks *near MP 32*.

– Map by WFP

Trapp, James

From: LIA07 Hoc
Sent: Friday, April 08, 2011 5:57 PM
Subject: OUO -- 1800 EDT (April 8, 2011) USNRC Earthquake-Tsunami Update
Attachments: USNRC Earthquake-Tsunami Update.040811.1800EDT.pdf

Attached, please find a 1800 EDT, April 8, 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.

-Sara

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

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OIP_ITServices Resource

From: LIA02 Hoc
Sent: Friday, April 08, 2011 7:51 AM
To: LIA02 Hoc; 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; 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 8, 2011 Should Read APRIL!

Please note that the document date should read April not March.

From: LIA02 Hoc
Sent: Friday, April 08, 2011 7:31 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; 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 8, 2011

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Attached is One Page Summary for March 8, 2011.

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April 8, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 81st Release)
(As of 16:00 April 8th, 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

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(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 April 8th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.496(A) 0.894(B)	0.081(A) 0.081(D)	0.097(A) 0.022(C)	—	0.104	0.106
CV Pressure (D/W) [kPa]	185	100	105.2	—	—	—
Reactor Water Level*2 [mm]	-1,650(A) -1,650(B)	-1,500(A) Not available(B)	-1,850(A) -2,250(B)	—	1,644	1,668
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	155	down scale (under survey)	172.2	—	—	—
Spent Fuel Pool Water Temperature [℃]	Indicator Failure	53.0	Indicator Failure	Indicator Failure	34.7	30.5
Time of Measurement	12:00 April 8th	12:00 April 8th	12:00 April 8th	April 8th	14:00 April 8th	14:00 April 8th

*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, $2.1\times10^5 Bq/cm^3$ of ^{131}I (Iodine) and $1.8\times10^6 Bq/cm^3$ 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 8th)
- Fresh water injection to RPV is being carried out. (As of 16:00 April 8th)

<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 measurements 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 8th)
- Fresh water injection to RPV is being carried out. (As of <u>08:00</u> April <u>8th</u>)

<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 of 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 8th)
- Fresh water injection to RPV is being carried out. (As of 16:00 April 8th)

<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 of around 20t using Concrete Pump Truck (50t/h) was carried out. (From 17:35 till 18:22 April 5th)
- Fresh water spray of around 38t using Concrete Pump Truck (50t/h) was carried out. (From 18:23 till 19:40 April 7th)
- White smoke was confirmed to generate continuously. (As of 06:30 April 8th)

<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 <u>07:20</u> April <u>8th</u>, water temperature of the pool was around <u>28</u>℃.

<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 (Around 10,000t) 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 outflow of the contaminated water 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 prevents 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 14:00 April 8th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.14	0.10	0.17
Reactor water temperature	℃	25.1	25.2	34.9	30.3
Reactor water level*2	mm	9,346	10,346	7,810	8,785
Suppression pool water temperature	℃	23	24	26	31
Suppression pool pressure	kPa (abs)	105	105	111	110
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.

(April 7th)

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

< Possibility on radiation exposure (As of 08:00 April 8th) >

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 6th, the screening was done to 133,972 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 8th)>

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.)
- 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.)
- 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.)
- On the afternoon of 7 April, a worker who was making sandbags at the soil disposal yard (spoil bank) on the north side of Fukushima Dai-ichi NPS got sick and was transported to J-Village for the body survey of contamination of radioactive materials. Being confirmed to be free from contamination, he was taken to the Iwaki City Kyouritsu Hospital by ambulance.

<Situation of resident evacuation (As of 08:00 April 8th)>

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 16:00 April 8th)

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 (Except Kitakata-City, Bandai-Town, Inawashiro-Town, Mishima-Town, Aizumisato-Town, Shimogo-Town and Minamiaizu-Town)	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**	
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 16:00 April 8th)

Scope under restriction	Water service (Local governments requested for restriction)

All residents	None
Babies ・Water services that continue to respond to the directive ・Tap-water supply service that continues to respond to the directive	<Fukushima Prefecture> Iitate small water service (Iitate Village, Fukushima Prefecture) 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.

News Release

経済産業省
Ministry of Economy, Trade and Industry

(Contact Person)
Mr. Toshihiro Bannai
Director, International Affairs Office, NISA/METI
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Fukushima Dai-ichi Nuclear Power Station Major Parameters of the Plant (As of 6:00, April 8th)

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 : 6 m^3/h (As of 17:30, April 3rd) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water : 7 m^3/h (As of 19:00, April 7th) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water: 7 m^3/h (As of 17:32, April 3rd) temporary measuring instrument	Under shutdown	Under shutdown	Under shutdown
Reactor water level	Fuel range A : -1,650mm Fuel range B : -1,650mm (As of 0:00, April 8th)	Fuel range A : -1,500mm (As of 3:00, April 8th)	Fuel range A:-2,000mm Fuel range B:-2,250mm (As of 1:30, April 8th)	#2	Shutdown range measurement 1,669mm (As of 6:00, April 8th)	Shutdown range measurement 1,691mm (As of 6:00, April 8th)
Reactor pressure	0.390MPa g(A) 0.788MPa g(B) (As of 0:00, April 8th)	-0.011MPa g (A) -0.016MPa g (D) (As of 3:00,April 8th)	-0.002MPa g (A) -0.081MPa g (C) (As of 1:30, April 8th)	#2	0.002MPa g (As of 6:00, April 8th)	0.003MPa g (As of 6:00, April 8th)
Reactor water temperature	(Impossible collection due to low system flow rate)			#2	33.2℃ (As of 6:00, April 8th)	22.1℃ (As of 6:00, April 8th)
Reactor Pressure Vessel (RPV) temperature	Feedwater nozzle temperature: 260.7℃ Temperature at the bottom head of RPV: 118.6℃ (As of 0:00, April 8th)	Feedwater nozzle temperature: 143.0℃ Temperature at the bottom head of RPV: #1 (As of 3:00, April 8th)	Feedwater nozzle temperature: 88.2℃ (under survey) Temperature at the bottom head of RPV: 110.8℃ (As of 1:30, April 8th)	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: 0.180MPa abs S/C: 0.150MPa abs (As of 3:00, April 8th)	D/W: 0.100MPa abs S/C:Down scale (under survey) (As of 3:00, April 8th)	D/W: 0.1061MPa abs S/C: 0.1726MPa abs (As of 1:30, April 8th)	#2		
CAMS*3	D/W: 1.00×10^{2}Sv/h S/C: 1.27×10^{1}Sv/h (As of 0:00, April 8th)	D/W: 3.00×10^{1}Sv/h S/C: 7.72×10^{-1}Sv/h (As of 3:00,April 8th)	D/W: 1.90×10^{1}Sv/h S/C: 7.48×10^{-1}Sv/h (As of 1:30, April 8th)	#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	63.0℃ (As of 3:00, April 8th)	#1	#1	34.8℃ (As of 6:00, April 8th)	28.0℃ (As of 6:00, April 8th)
FPC skimmer level	4,500mm (As of 0:00, April 8th)	5,500mm (As of 3:00, April 8th)	#1	4,950mm (As of 1:30, April 8th)	#2	
Power supply	Receiving external power supply (P/C*4 2C)		Receiving external power supply (P/C4D)		Receiving external power supply	

Other information	Unit2: Confirmed the indicated value of S/C Pressure but continuing to survey the transition of condition Unit3: Collecting the data of RPV temperature and continuing survey for transitional situation	Common pool: about 28 ℃ (As of 7:45, April 7th)	Unit5: SHC*5 mode (From 19:20 April 7th)	Unit6: SHC*5 mode (From 10:16 April 7th)

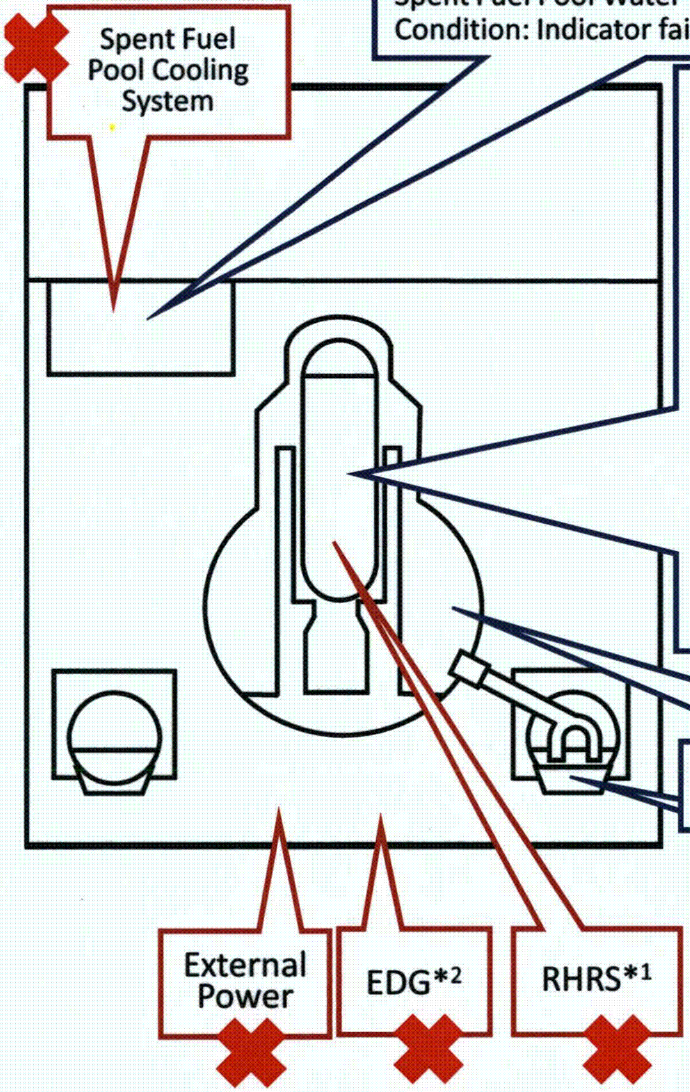
Pressure conversion	Gauge pressure (MPa g) = Absolute pressure (MPa abs) – Atmospheric pressure (Normal atmospheric pressure 0.1013MPa) Absolute pressure (MPa abs) = Gauge pressure (MPa g) + Atmospheric pressure (Normal atmospheric pressure 0.1013MPa)

*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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1
(As of 6:00 April 8th, 2011)

Spent Fuel Pool Water Temperature — ℃
Condition: Indicator failure



Reactor Pressure A 0.491MPa*
Reactor Pressure B 0.889MPa*
Condition : Tend to increase
*converted to absolute pressure
Reactor Water Level A −1,650mm
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 :260.7℃
Temperature at the bottom head of RPV :118.6℃

PCV*3 Pressure 0.180MPa
Condition: Tend to increase

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure 0.150MPa
Condition : No large fluctuation

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

Major Events after the earthquake

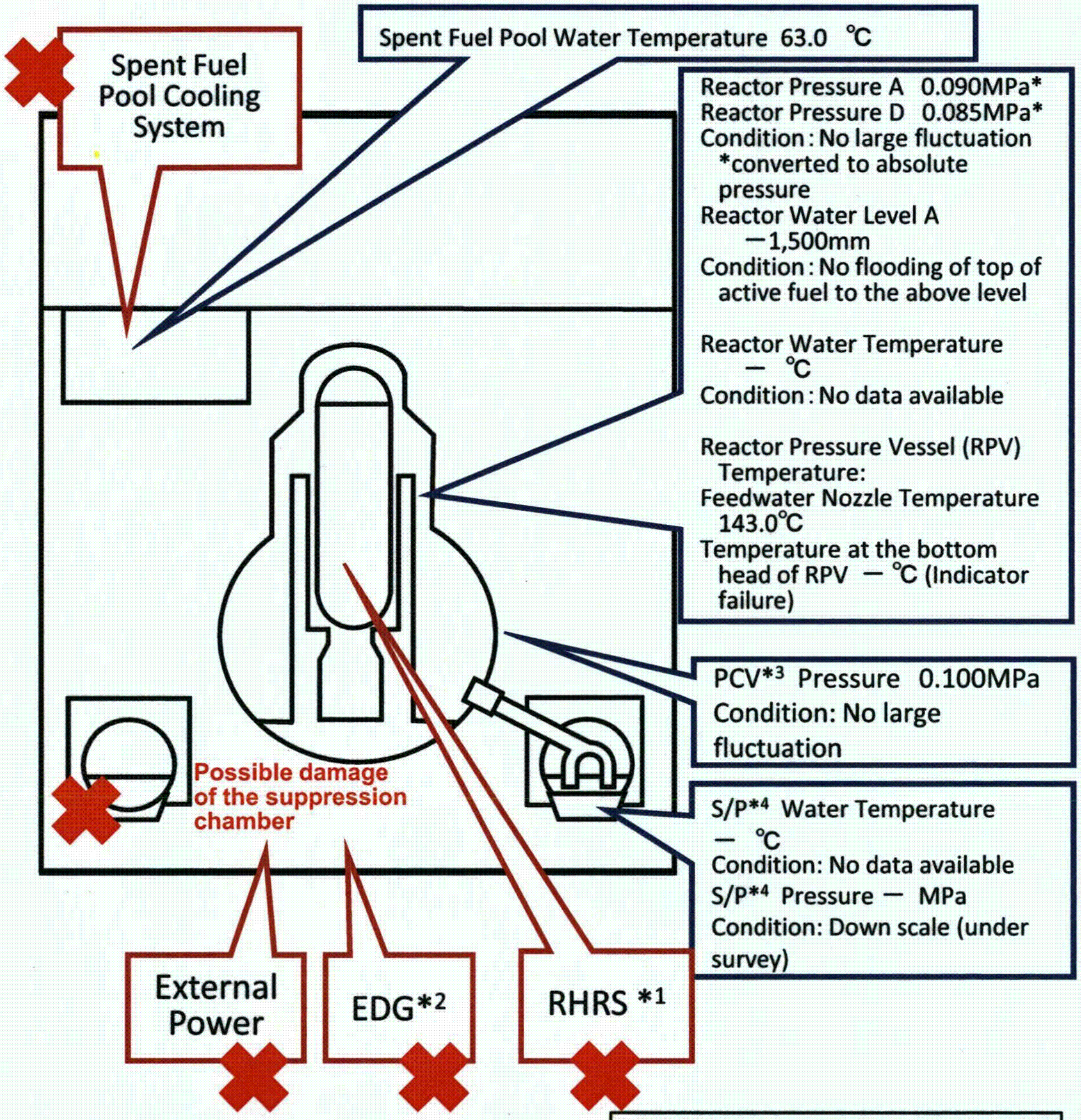
11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 15:42 Report based on the Article 10 (Total loss of A/C power)
11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
12th 01:20 Occurrence of the Article 15 event (Unusual 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. ($2m^3/h \rightarrow 18m^3/h$)
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 12:00 ～2nd 15:26 Started to transfer the stagnant water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
31st 13:03～16:04 Water spray by Concrete Pump Truck (Fresh water)
3rd 12:02 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
3rd 13:55 Started to transfer the water from the condenser to CST.
6th 22:30 Started the operation for the injection of nitrogen to PCV.
7th 01:31 Confirmed starting the injection of nitrogen to PCV.

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 6:00 April 8th, 2011)



*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

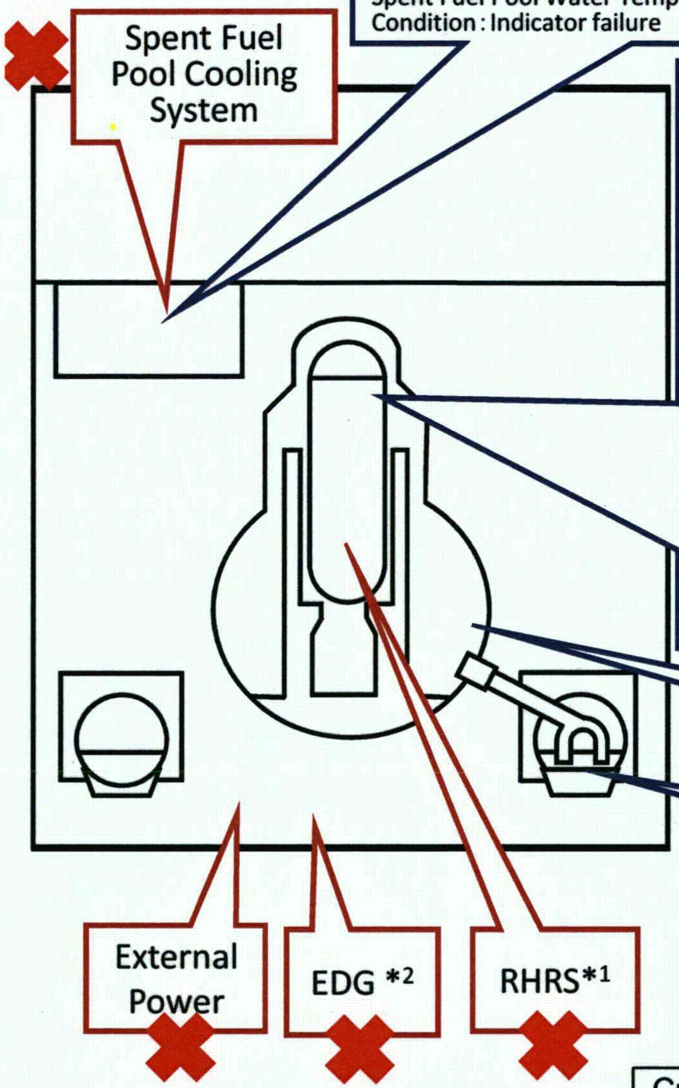
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

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 seawater 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.
- 29th 16:45～1st 11:50 Transferred the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
- 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)
- 1st 14:56～17:05 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
- 2nd around 9:30 The water, of which the dose rate was at the level of more than 1,000mSv/h, was confirmed to be collected in the pit located near the Intake Channel of Unit 2. The outflow from the lateral surface of the pit into the sea was also confirmed.
- 2nd 17:10 Started to transfer the water from the condenser to the Condensate Storage Tank (CST).
- 3rd 12:12 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
- 3rd 13:47～14:30 20 bags of sawdust, 80 bags of high polymer absorbent and 3 bags of cutting-processed newspaper were put into the Pit for the Conduit.
- 4th 7:08～7:11 Approximately 13kg of tracer (bath agent) was put in from the Pit for the Duct for Seawater Pipe.
- 4th 11:05～13:37 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
- 5th 14:15 Tracer is confirmed to outflow through the permeable layer around the pit into the sea.
  15:07 Started to inject coagulant.
- 6th around 5:38 The water outflow from the lateral surface of the pit was confirmed to stopped.
- 7th 13:29～14:34 Freshwater injection to SFP via FPC (Around 36 ton)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

(As of 6:00 April 8th, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition : Indicator failure

Reactor Pressure A 0.099MPa*
Reactor Pressure C 0.020MPa*
Condition : No large fluctuation
*converted to absolute pressure
Reactor Water Level A −2,000mm
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 :88.2℃(under survey)
Temperature at the bottom head of RPV : 110.8℃

PCV*3 Pressure 0.1061MPa
Condition: No large fluctuation

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure 0.1726MPa
Condition: No large fluctuation

*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

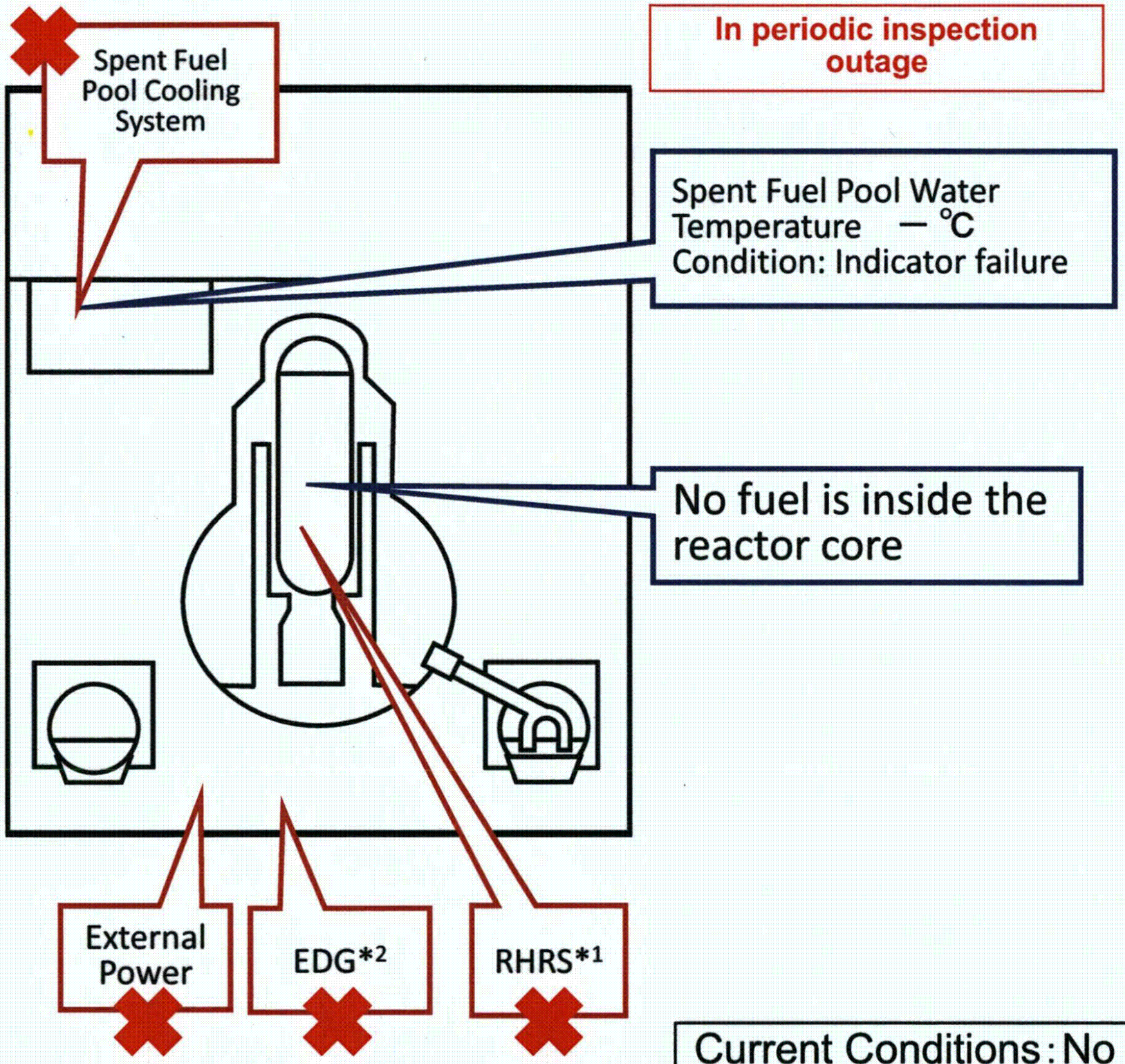
Major Events after the earthquake

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 around 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 17:40～31st around 8:40 Transferring the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
28th 20:30 Switched to the water injection to the core using a temporary motor-driven pump.
29th 14:17～18:18, 31st 16:30～19:33, 2nd 09:52～12:54, 4th 17:03～19:19 Water spray by Concrete Pump Truck (Fresh water)
3rd 12:18 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
7th 06:53 ～08:53 Water spray by Concrete Pump Truck (Fresh water) (Around 70 ton)

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4

(As of 6:00 April 8th, 2011)



*1 Residual Heat Removal System

*2 Emergency Diesel Generator

*3 Reactor Pressure Vessel

Major events after the earthquake

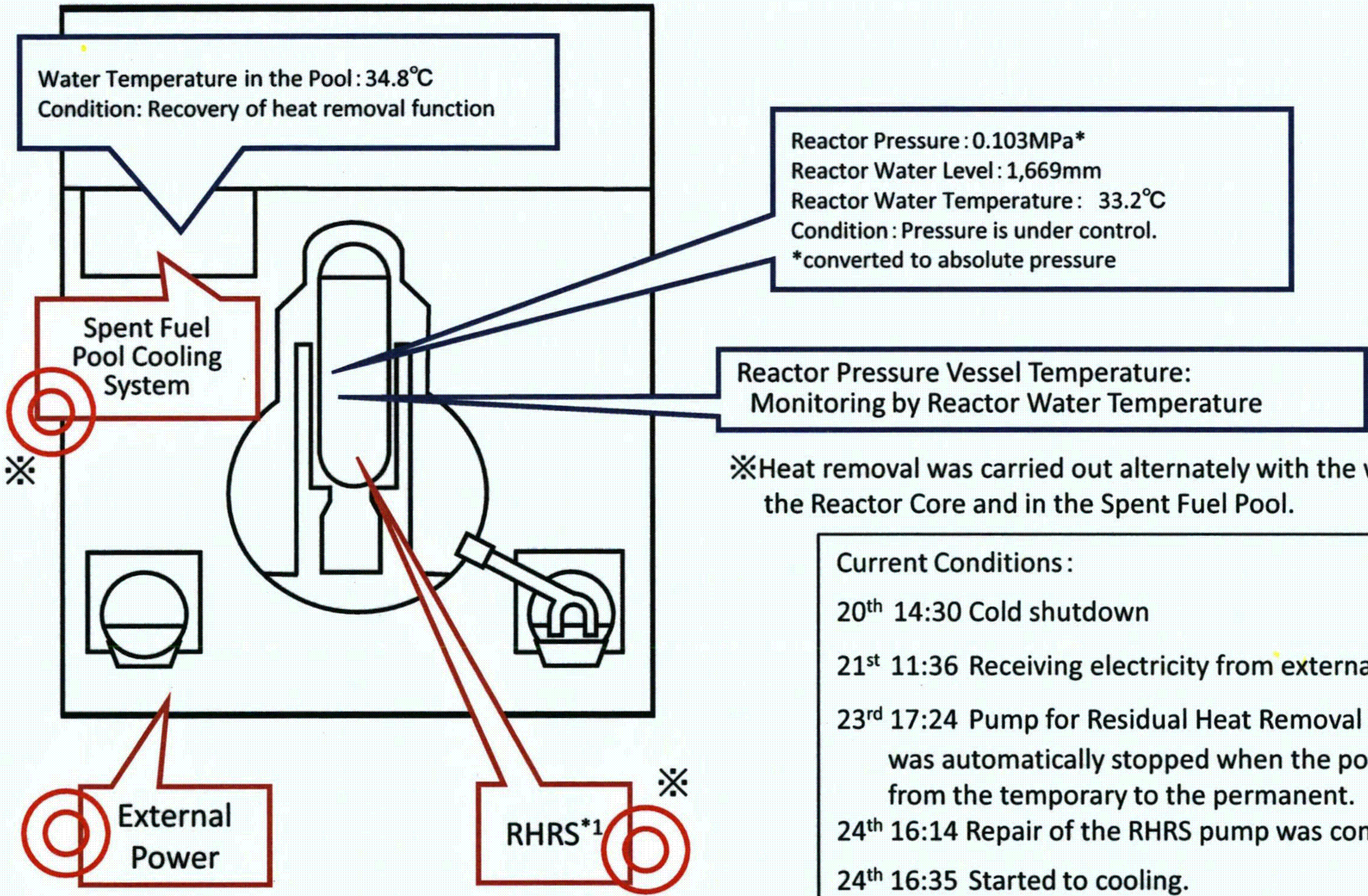
In periodic inspection outage when the earthquake occurred
- 14th 04:08 Water temperature in the Spent Fuel Pool (SFP), 84℃
- 15th 06:14 Confirmed the partial damage of wall in the 4th floor.
- 15th 09:38 Fire occurred in the 3rd floor. (12:25 extinguished)
- 16th 05:45 Fire occurred. TEPCO couldn't 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 around 15:00 Work for laying cable to Power Center was completed.
- 22nd 10:35 Power Center received electricity.
- 22nd 17:17～20:32, 23rd 10:00～13:02, 24th 14:36～17:30, 25th 19:05～22:07, 27th 16:55～19:25 Water spray by Concrete Pump Truck
- 25th 06:05～10:20 Sea water injection to SFP via the Fuel Pool Cooling Line (FPC)
- 29th 11:50 Lighting in the Central Control Room was recovered.
- 30th 14:04～18:33, 1st 8:28～14:14, 3rd 17:14～22:16, 5th 17:35～18:22, 7th 18:23～19:40 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 6:00 April 8th, 2011)

In periodic inspection outage



※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.

4th 21:00 Started to discharge the groundwater with low-level radioactivity in the Sub Drain Pit to the sea.

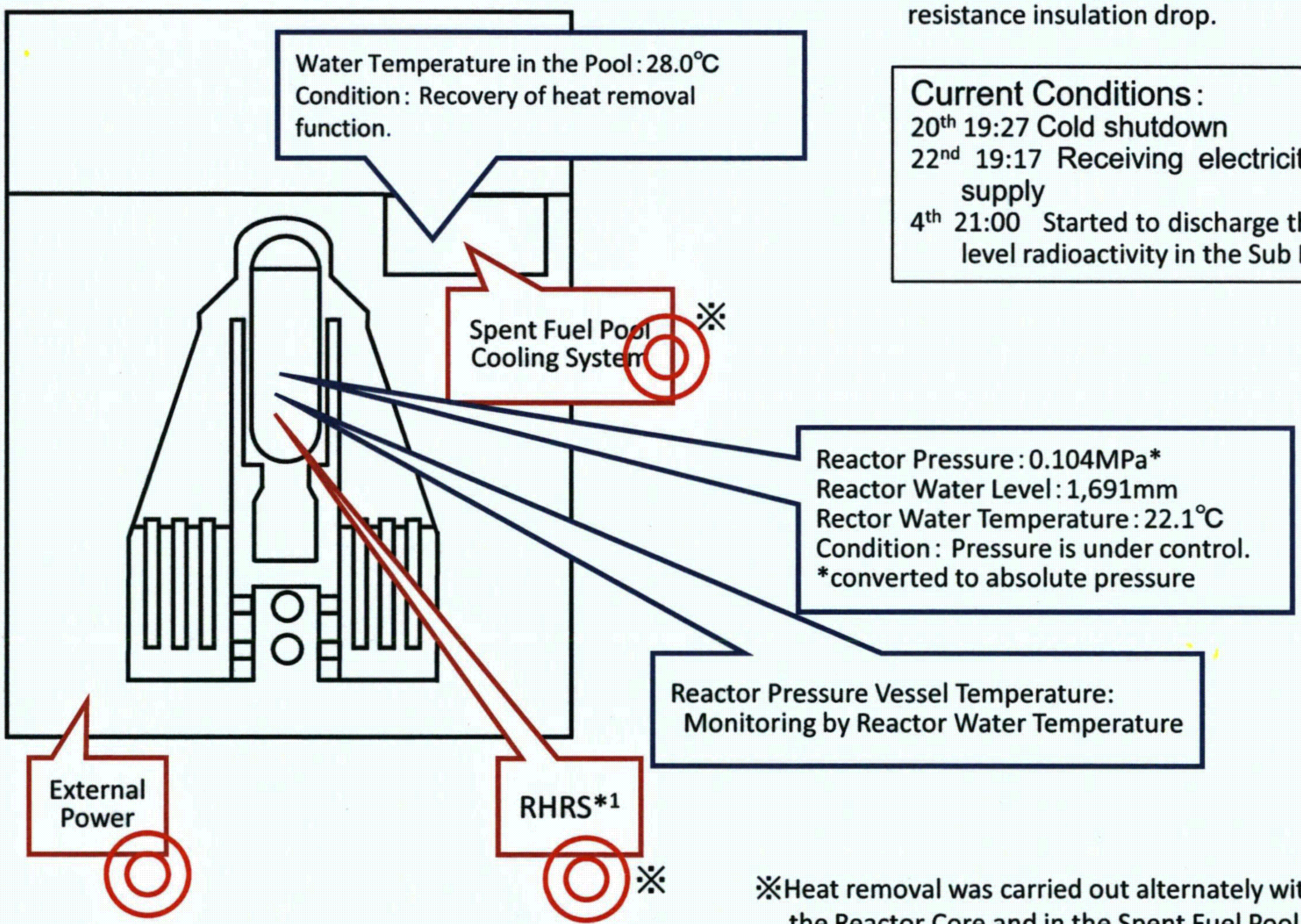
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 6:00 April 8th, 2011)

In periodic inspection outage

The Emergency Diesel Generator (D/G) 6A was excluded from standby because of insulation resistance insulation drop.

Current Conditions:
20th 19:27 Cold shutdown
22nd 19:17 Receiving electricity from external power supply
4th 21:00 Started to discharge the groundwater with low-level radioactivity in the Sub Drain Pit to the sea



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

*1 Residual Heat Removal System

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

Fukushima Dai-ichi Nuclear Power Station Major Parameters of the Plant (As of 6:00, April 7th)

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 : 6 m^3/h (As of 17:30, April 3rd) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water : 8 m^3/h (As of 12:12, April 3rd) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water: 7 m^3/h (As of 17:32, April 3rd) temporary measuring instrument	Under shutdown	Under shutdown	Under shutdown
Reactor water level	Fuel range A : -1,650mm Fuel range B : -1,650mm (As of 6:00, April 7th)	Fuel range A : -1,500mm (As of 6:00, April 7th)	Fuel range A:-1,850mm Fuel range B:-2,250mm (As of 6:00, April 7th)	#2	Shutdown range measurement 1,822mm (As of 6:00, April 7th)	Shutdown range measurement 1,866mm (As of 6:00, April 7th)
Reactor pressure	0.363MPa g(A) 0.758MPa g(B) (As of 6:00, April 7th)	-0.018MPa g (A) -0.025MPa g (D) (As of 6:00,April 7th)	0.002MPa g (A) -0.079MPa g (C) (As of 6:00, April 7th)	#2	0.002MPa g (As of 6:00, April 7th)	0.005MPa g (As of 6:00, April 7th)
Reactor water temperature	(Impossible collection due to low system flow rate)			#2	34.8℃ (As of 6:00, April 7th)	48.1℃ (As of 6:00, April 7th)
Reactor Pressure Vessel (RPV) temperature	Feedwater nozzle temperature: 216.3℃ Temperature at the bottom head of RPV: 116.2℃ (As of 6:00, April 7th)	Feedwater nozzle temperature: 144.2℃ Temperature at the bottom head of RPV: #1 (As of 6:00, April 7th)	Feedwater nozzle temperature: 83.4℃ (under survey) Temperature at the bottom head of RPV: 115.8℃ (As of 6:00, April 7th)	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: 0.155MPa abs S/C: 0.155MPa abs (As of 6:00, April 7th)	D/W: 0.100MPa abs S/C:Down scale (under survey) (As of 6:00, April 7th)	D/W: 0.1075MPa abs S/C: 0.1729MPa abs (As of 6:00, April 7th)	#2		
CAMS*3	D/W: 3.08×10^{1}Sv/h S/C: 1.29×10^{1}Sv/h (As of 6:00, April 7th)	D/W: 3.06×10^{1}Sv/h S/C: 8.01×10^{-1}Sv/h (As of 6:00,April 7th)	D/W: 1.96×10^{1}Sv/h S/C: 7.77×10^{-1}Sv/h (As of 6:00, April 7th)	#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	48.0℃ (As of 6:00, April 7th)	#1	#1	34.8℃ (As of 6:00, April 7th)	21.5℃ (As of 6:00, April 7th)
FPC skimmer level	4,500mm (As of 6:00, April 7th)	5,600mm (As of 6:00, April 7th)	#1	4,950mm (As of 6:00, April 7th)	#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	Common pool: about 27 ℃ (As of 8:00, April 6th)	Unit5: SHC*5 mode (From 19:15 April 6th)	Unit6: Supplemental Fuel Pool Cooling mode (From 17:10 April 6th)

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)

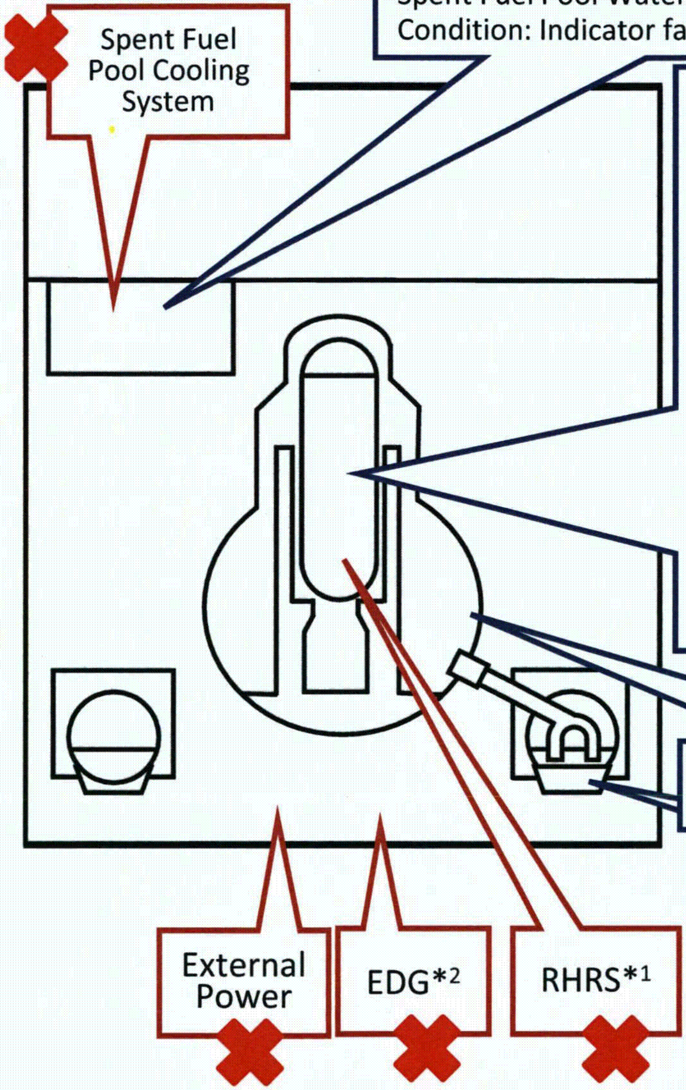
(Notes) Concerning reactor pressure of Units 1 and 3, the rate of converting voltage measured by digital voltmeters into pressure has been corrected. Please refer to the attached sheet of "Major Parameters of the Plant" as of 20:00 April 6th.

*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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1

(As of 14:00 April 8th, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition: Indicator failure

Reactor Pressure A 0.496MPa*
Reactor Pressure B 0.894MPa*
Condition : Tend to increase
*converted to absolute pressure
Reactor Water Level A −1,650mm
Reactor Water Level B −1,650mm
Condition: No flooding of top of active fuel until the above level

Reactor Water Temperature — ℃
Condition: No large fluctuation

Reactor Pressure Vessel (RPV) Temperature:
Feedwater Nozzle Temperature :246.6℃
Temperature at the bottom head of RPV :119.4℃

PCV*3 Pressure 0.185MPa
Condition: Tend to increase

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure 0.155MPa
Condition : No large fluctuation

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

Major Events after the earthquake

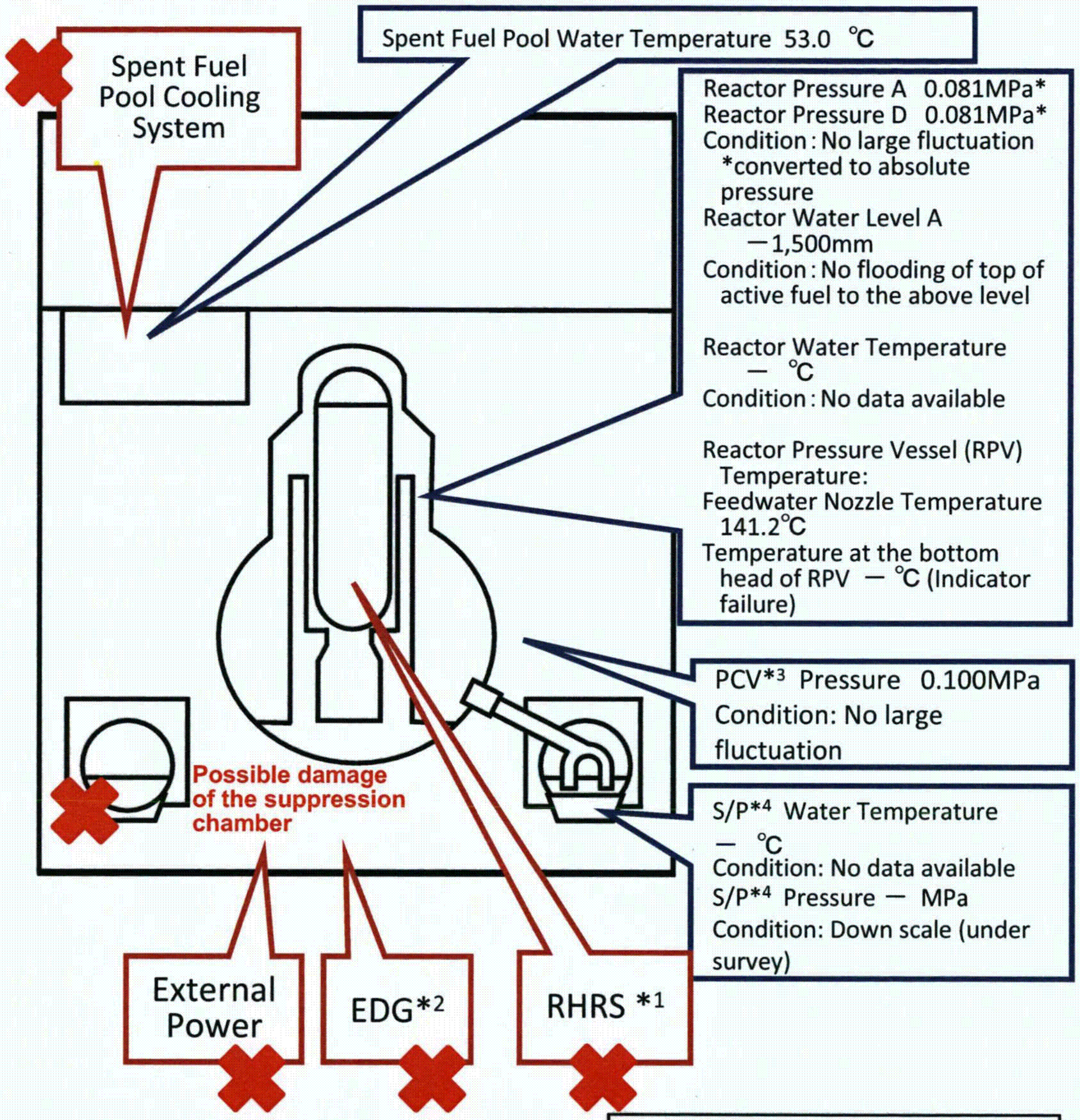
- 11th 14:46 Under operation, Automatic shutdown by the earthquake
- 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 12th 01:20 Occurrence of the Article 15 event (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. ($2m^3/h \rightarrow 18m^3/h$)
  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 12:00 ～2nd 15:26 Started to transfer the stagnant water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
- 31st 13:03～16:04 Water spray by Concrete Pump Truck (Fresh water)
- 3rd 12:02 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
- 3rd 13:55 Started to transfer the water from the condenser to CST.
- 6th 22:30 Started the operation for the injection of nitrogen to PCV.
- 7th 01:31 Confirmed starting the injection of nitrogen to PCV.

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 April 8th, 2011)



*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)

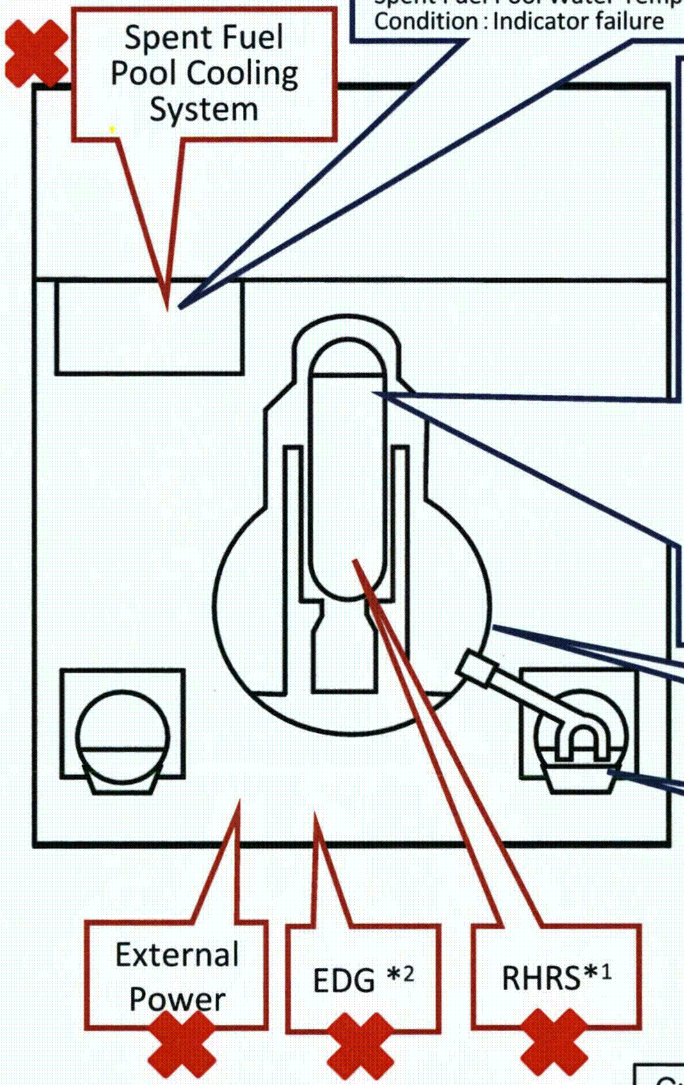
Major Events after the earthquake

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 seawater 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.
29th 16:45～1st 11:50 Transferred the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
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)
1st 14:56～17:05 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
2nd around 9:30 The water, of which the dose rate was at the level of more than 1,000mSv/h, was confirmed to be collected in the pit located near the Intake Channel of Unit 2. The outflow from the lateral surface of the pit into the sea was also confirmed.
2nd 17:10 Started to transfer the water from the condenser to the Condensate Storage Tank (CST).
3rd 12:12 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
3rd 13:47～14:30 20 bags of sawdust, 80 bags of high polymer absorbent and 3 bags of cutting-processed newspaper were put into the Pit for the Conduit.
4th 7:08～7:11 Approximately 13kg of tracer (bath agent) was put in from the Pit for the Duct for Seawater Pipe.
4th 11:05～13:37 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
5th 14:15 Tracer is confirmed to outflow through the permeable layer around the pit into the sea.
15:07 Started to inject coagulant.
6th around 5:38 The water outflow from the lateral surface of the pit was confirmed to stopped.
7th 13:29～14:34 Freshwater injection to SFP via FPC (Around 36 ton)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

（As of 14:00 April 8th, 2011）

Spent Fuel Pool Water Temperature — ℃
Condition : Indicator failure



Reactor Pressure A 0.097MPa*
Reactor Pressure C 0.022MPa*
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 :88.8℃(under survey)
Temperature at the bottom head of RPV : 110.7℃

PCV*3 Pressure 0.1052MPa
Condition: No large fluctuation

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure 0.1722MPa
Condition: No large fluctuation

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

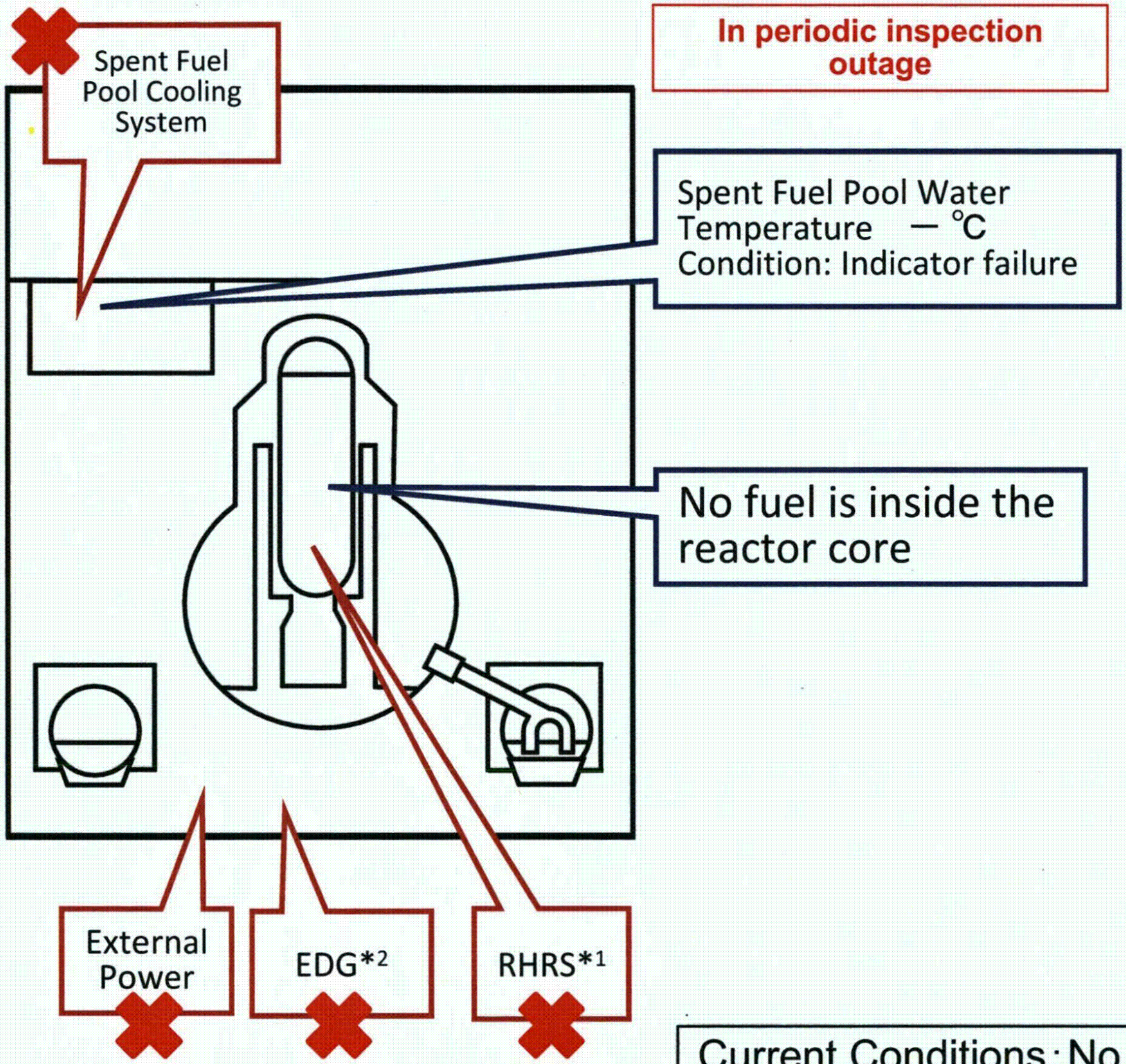
Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the core

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 around 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 17:40～31st around 8:40 Transferring the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
28th 20:30 Switched to the water injection to the core using a temporary motor-driven pump.
<Water spray by Concrete Pump Truck (Fresh water)>
29th 14:17～18:18, 31st 16:30～19:33, 2nd 09:52～12:54, 4th 17:03～19:19, 7th 06:53 ～08:53
3rd 12:18 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
(As of 14:00 April 8th, 2011)



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 around 15:00 Work for laying cable to Power Center was completed.
22nd 10:35 Power Center received electricity.
<Water spray by Concrete Pump Truck>
22nd 17:17～20:32, 23rd 10:00～13:02, 24th 14:36～17:30, 25th 19:05～22:07, 27th 16:55～19:25
5th 06:05～10:20 Sea water injection to SFP via the Fuel Pool Cooling Line (FPC)
29th 11:50 Lighting in the Central Control Room was recovered.
< Water spray by Concrete Pump Truck (Fresh water)>
30th 14:04～18:33, 1st 08:28～14:14, 3rd 17:14～22:16, 5th 17:35～18:22, 7th 18:23～19:40

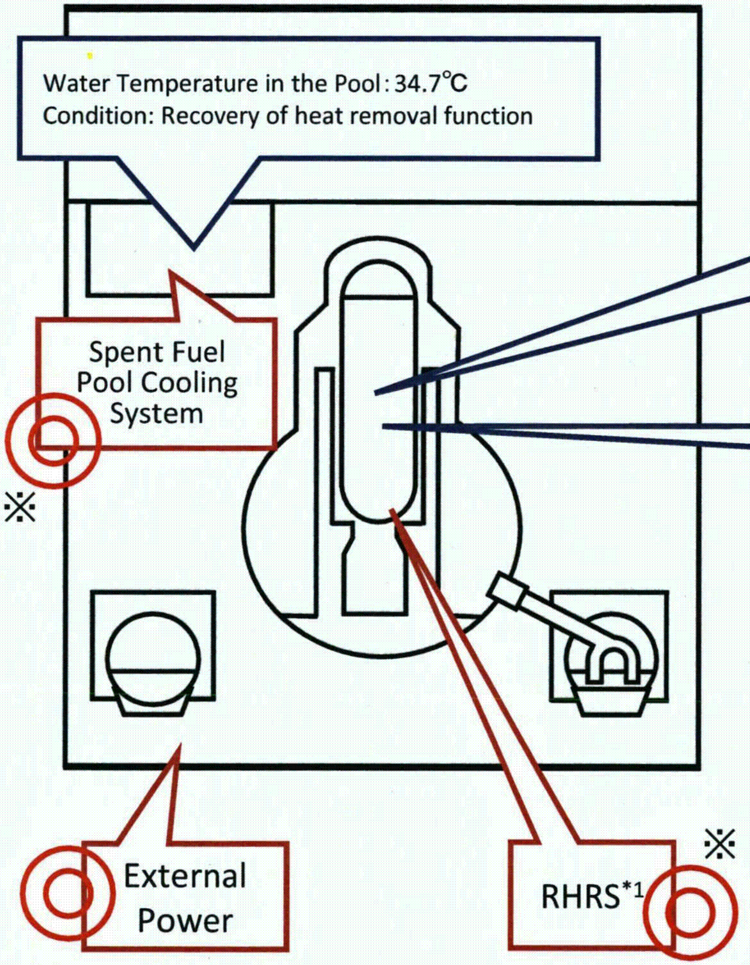
*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Reactor Pressure Vessel

**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 April 8th, 2011)

In periodic inspection outage



Reactor Pressure: 0.104MPa*
Reactor Water Level: 1,644mm
Reactor Water Temperature: 45.5℃
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.

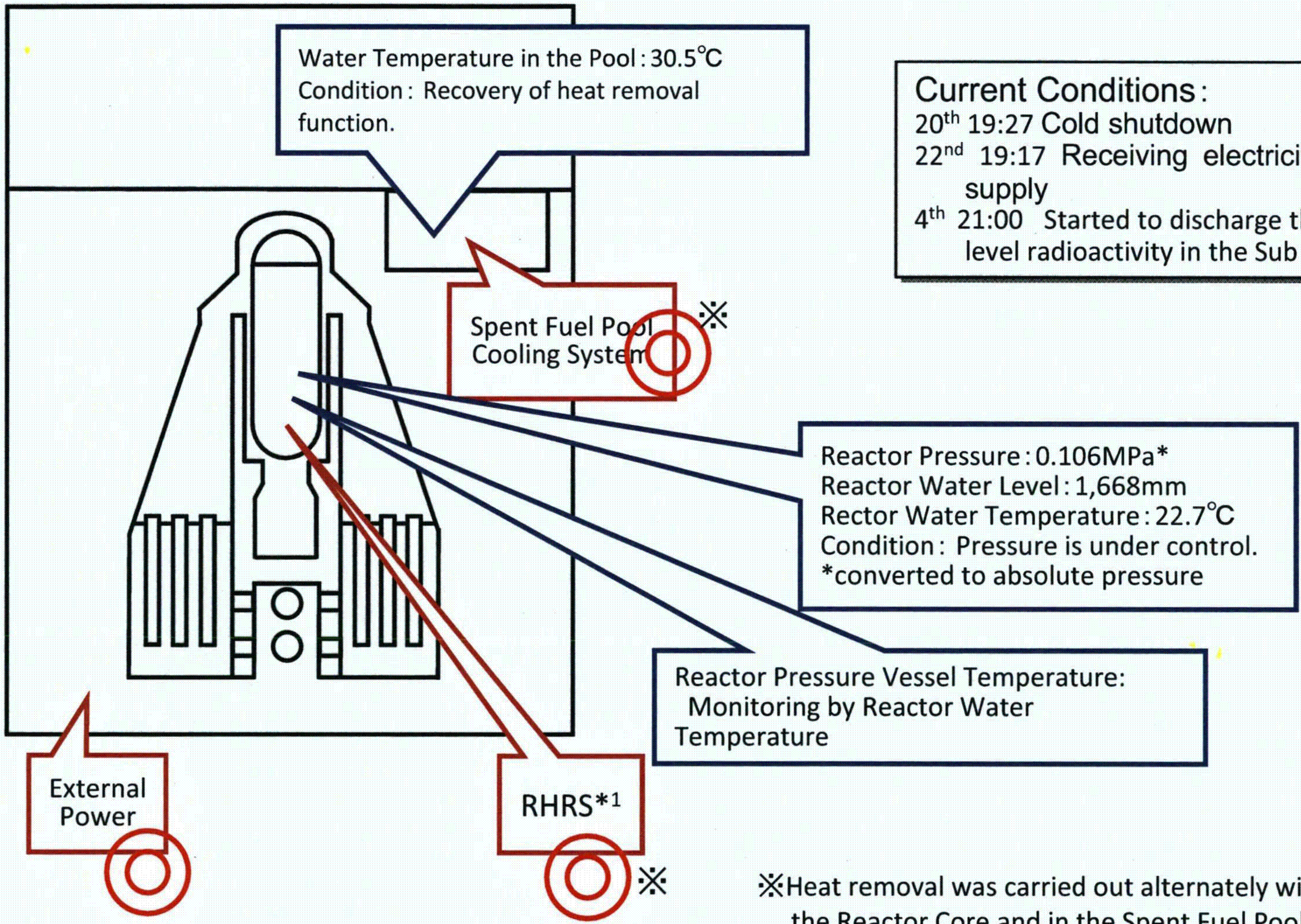
4th 21:00 Started to discharge the groundwater with low-level radioactivity in the Sub Drain Pit to the sea.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 14:00 April 8th, 2011)

In periodic inspection outage

Current Conditions:
20th 19:27 Cold shutdown
22nd 19:17 Receiving electricity from external power supply
4th 21:00 Started to discharge the groundwater with low-level radioactivity in the Sub Drain Pit to the sea



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

*1 Residual Heat Removal System

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

2011/4/9 10:31

April 8th, 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 westsouthwest 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
MC	Reading(μ Sv/h)	56.0	56.0	56.1	56.1	56.2	56.0	56.0	55.7	55.7	55.6	55.5	55.6
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	681	–	–	683	–	–	685	–	–	684	–	–
	⑦MG(μ Sv/h)*2	99	–	–	97	–	–	97	–	–	98	–	–
	③WG(μ Sv/h)*3	43.3	–	–	43.5	–	–	43.4	–	–	43.1	–	–
wind direction		WNW	SW	SSE	W	W	W	W	WNW	N	N	WNW	W
wind speed (m/s)		0.4	0.6	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.4	0.4

Monitoring points		③											
Reading time		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(μ Sv/h)	55.5	55.6	55.6	55.6	55.5	55.4	55.4	55.4	55.3	55.3	55.3	55.2
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	675	–	–	682	–	–	679	–	–	679	–	–
	⑦MG(μ Sv/h)*2	97	–	–	98	–	–	97	–	–	97	–	–
	③WG(μ Sv/h)*3	43.1	–	–	43.4	–	–	43.2	–	–	43.2	–	–
wind direction		W	N	SE	SSE	SE	SSE	SSE	SE	SSE	S	W	SE
wind speed (m/s)		0.3	0.4	0.5	0.8	0.9	0.9	1.0	1.0	0.4	0.5	0.5	0.4

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate
*4: NM: Not measured due to the malfunction

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
MC	Reading(μ Sv/h)	55.2	55.2	55.3	55.3	55.3	55.1	55.2	55.2	55.1	55.1	55.1	55.1
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	675	–	–	676	–	–	676	–	–	677	–	–
	⑦MG(μ Sv/h)*2	95	–	–	97	–	–	97	–	–	96	–	–
	③WG(μ Sv/h)*3	43.1	–	–	43.1	–	–	42.8	–	–	43.0	–	–
wind direction		E	W	W	W	WNW	W	S	SSE	SE	S	SSE	SE
wind speed (m/s)		0.3	0.8	0.8	0.6	0.6	0.7	0.7	0.8	1.0	0.6	1.0	0.7

Monitoring points		③											
Reading time		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(μ Sv/h)	55.1	55.0	55.0	55.1	55.1	55.1	55.0					
	neutron	ND	ND	ND	ND	ND	ND	ND					
TM	⑥SMOB(μ Sv/h)*1	677	–	–	676	–	–	676					
	⑦MG(μ Sv/h)*2	97	–	–	97	–	–	96					
	③WG(μ Sv/h)*3	42.9	–	–	43.0	–	–	43.0					
wind direction		W	SSW	SE	ESE	SE	ESE	ESE					
wind speed (m/s)		0.5	0.6	0.7	0.9	0.9	1.3	1.5					

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
MC	Reading(μ Sv/h)												
	neutron												
TM	⑥SMOB(μ Sv/h)*1												
	⑦MG(μ Sv/h)*2												
	③WG(μ Sv/h)*3												
wind direction													
wind speed (m/s)													

Monitoring points		③											
Reading time		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(μ Sv/h)												
	neutron												
TM	⑥SMOB(μ Sv/h)*1												
	⑦MG(μ Sv/h)*2												
	③WG(μ Sv/h)*3												
wind direction													
wind speed (m/s)													

April 7th, 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 westsouthwest 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(μ Sv/h)	58.0	57.9	57.8	57.9	57.8	57.7	57.7	57.6	57.7	57.6	57.6	57.7	57.6	57.7	57.6	57.5	57.4	57.6	57.4	57.5	57.3	57.3	57.3	57.3
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	679	-	-	672	-	-	677	-	-	679	-	-	677	-	-	673	-	-	671	-	-	667	-	-
	⑦MG(μ Sv/h)*2	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4
	③WG(μ Sv/h)*3	44.2	-	-	43.8	-	-	43.8	-	-	43.5	-	-	43.7	-	-	43.4	-	-	43.0	-	-	42.9	-	-
wind direction		E	SE	NE	SE	E	E	E	E	E	E	E	ESE	E	E	NE	SE	E	SE	E	SE	ESE	E	E	E
wind speed (m/s)		1.8	1.8	2.3	2.2	1.8	1.6	1.6	1.5	1.6	2.1	2.2	2.1	1.9	1.8	1.8	1.6	1.5	1.9	1.5	2.6	2.6	2.9	2.0	2.2

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate
*4: NM: Not measured due to the malfunction

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(μ Sv/h)	57.1	57.2	57.1	57.1	57.1	57.1	56.8	57.0	56.9	56.7	56.9	56.8	56.8	56.9	56.8	56.8	56.7	56.7	56.6	56.8	56.7	56.7	56.7	56.7
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	671	-	-	668	-	-	665	-	-	667	-	-	669	-	-	668	-	-	676	-	-	675	-	-
	⑦MG(μ Sv/h)*2	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	101	-	-	98	-	-	99	-	-	100	-	-	101	-	-	98	-	-
	③WG(μ Sv/h)*3	43.0	-	-	42.7	-	-	42.6	-	-	42.6	-	-	42.3	-	-	42.8	-	-	42.8	-	-	42.7	-	-
wind direction		E	ESE	E	E	E	SE	E	ESE	W	S	E	N	E	S	SW	S	SW	NW	SSE	S	N	WNW	SSW	SSW
wind speed (m/s)		1.9	2.1	1.8	1.7	1.5	1.3	1.3	1.1	0.8	0.9	0.8	0.5	0.4	0.5	0.5	0.5	0.4	0.3	0.5	0.4	0.7	0.4	0.2	0.5

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(μ Sv/h)	56.7	56.7	56.5	56.6	56.5	56.6	56.5	56.5	56.5	56.4	56.5	56.5	56.5	56.4	56.2	56.3	56.3	56.2	56.3	56.1	56.2	56.1	56.1	56.1
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	674	-	-	678	-	-	679	-	-	680	-	-	684	-	-	683	-	-	685	-	-	681	-	-
	⑦MG(μ Sv/h)*2	98	-	-	100	-	-	100	-	-	99	-	-	98	-	-	99	-	-	99	-	-	98	-	-
	③WG(μ Sv/h)*3	42.6	-	-	43.3	-	-	43.2	-	-	43.0	-	-	43.0	-	-	43.2	-	-	43.3	-	-	43.2	-	-
wind direction		WNW	SW	WNW	WNW	NW	ESE	N	WNW	E	SSW	WSW	WNW	W	WSW	ESE	S	WSW	SSW	WNW	W	WSW	W	SW	SSW
wind speed (m/s)		0.6	0.6	0.8	0.7	0.3	0.5	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.3	0.4	0.5	0.4	0.4	0.5	0.6	0.5

Monitoring Post (as of 15:00)

※Check readings once a day

Monitoring Poists	MP-1	MP-2	MP-3	MP-4	MP-5	MP-6	MP-7	MP-8
Reading (μ Sv/h)	15	45	47	47	95	140	280	230

※As for MP-1 and 2, readings were observed by human eyes (Coulc not be transmitted because of system trouble)
※As for MP-3 to 8, readings were transmitted by system

2011/4/9 10:31

April 7th, 2011

Fukushima Dai-ichi Monitoring points

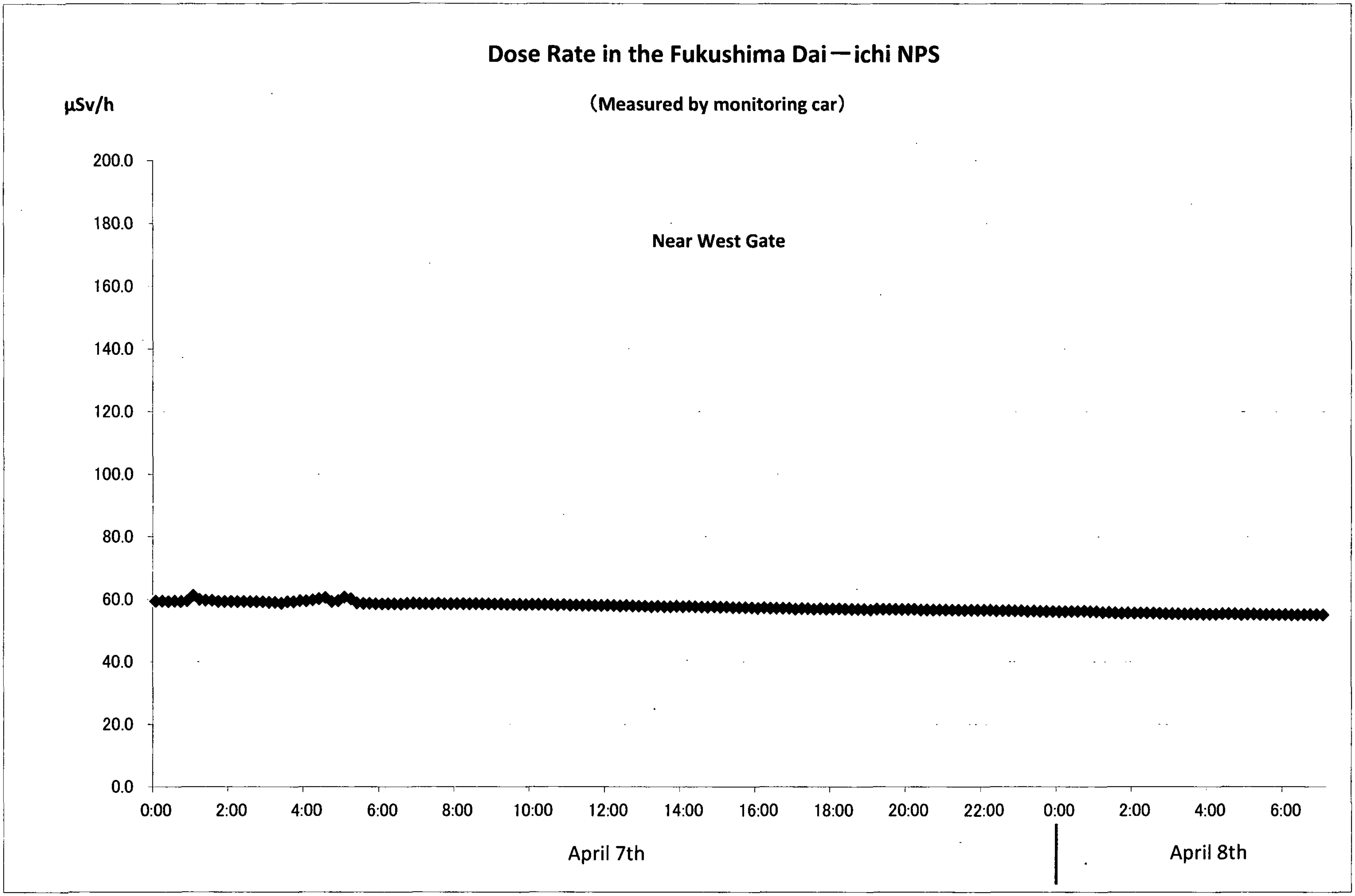
① North side of main office building(approx. 0.5km from Unit 2 in northwest direction)
② Near Gymnasium(East side of MP-5) (approx. 0.9km from Unit 2 in westnorthwest direction)
③ Near West Gate (near MP-5) (approx. 1.1km from Unit 2 in west direction)
④ Front of near Main Gate (near MP-6) (approx. 1.0km from Unit 2 in westsouthwest 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(μ Sv/h)	59.4	59.4	59.3	59.4	59.3	59.5	61.3	59.9	59.7	59.6	59.3	59.3	59.3	59.2	59.3	59.2	59.2	59.2	59.0	59.0	58.7	59.2	59.2	59.5
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	713	-	-	716	-	-	709	-	-	712	-	-	710	-	-	709	-	-	712	-	-	708	-	-
	⑦MG(μ Sv/h)*2	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-
	③WG(μ Sv/h)*3	46.6	-	-	46.7	-	-	48.0	-	-	46.8	-	-	46.7	-	-	46.6	-	-	46.8	-	-	46.9	-	-
wind direction		NE	W	SE	WNW	E	W	W	W	SE	WNW	W	NW	WSW	WNW	WNW	N	NNW	NW	NE	SW	W	W	NNW	E
wind speed (m/s)		0.3	0.4	0.2	0.3	0.6	0.3	0.3	0.3	0.4	0.7	0.6	0.6	0.6	0.6	0.4	0.6	0.7	0.8	0.6	0.4	0.6	0.5	0.4	0.3

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate
*4: NM: Not measured due to the malfunction

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(μ Sv/h)	59.4	59.7	60.1	60.5	59.2	59.5	60.6	60.1	58.8	58.6	58.6	58.5	58.5	58.5	58.5	58.4	58.6	58.6	58.5	58.5	58.4	58.6	58.4	58.4
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	708	-	-	712	-	-	711	-	-	708	-	-	709	-	-	708	-	-	706	-	-	709	-	-
	⑦MG(μ Sv/h)*2	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-	NM *4	-	-
	③WG(μ Sv/h)*3	47.0	-	-	47.9	-	-	48.0	-	-	46.4	-	-	46.5	-	-	46.7	-	-	46.4	-	-	46.2	-	-
wind direction		SSE	WNW	W	SE	NE	N	NNE	W	W	W	SW	W	W	SW	W	W	WSW	SW	W	WSW	SW	SW	SE	ESE
wind speed (m/s)		0.5	0.4	0.2	0.6	0.4	0.4	0.3	0.5	0.5	0.6	0.4	0.7	0.8	0.6	0.5	0.5	0.5	0.2	0.4	0.4	0.4	0.5	0.7	0.8

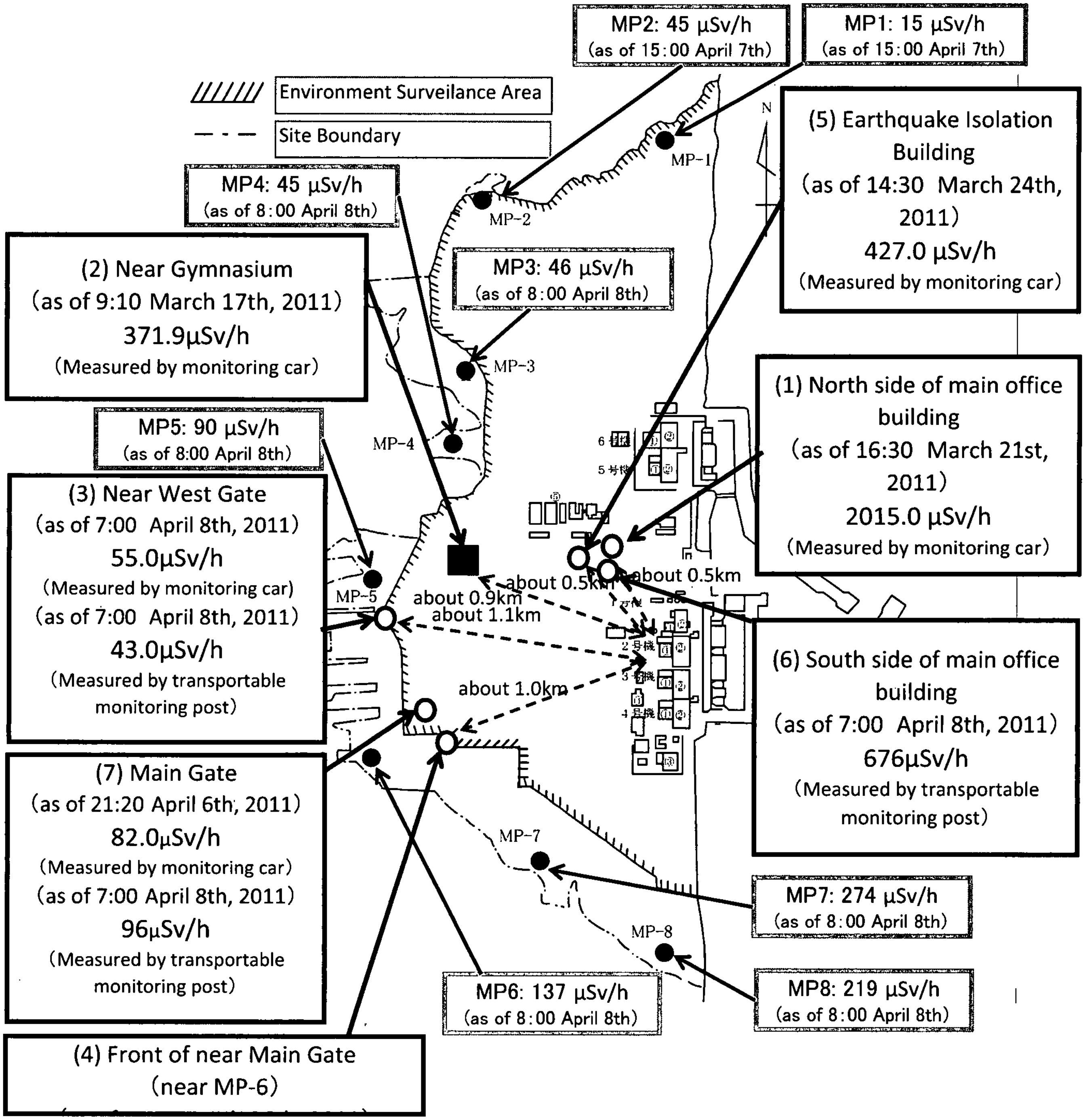
Monitoring points		③																							
Reading time		8:00	8:10	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	9:40	9:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
MC	Reading(μ Sv/h)	58.5	58.5	58.4	58.5	58.4	58.4	58.4	58.4	58.3	58.3	58.3	58.2	58.2	58.2	58.2	58.2	58.0	58.2	58.0	58.1	58.0	58.0	57.9	57.9
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	710	-	-	706	-	-	700	-	-	698	-	-	692	-	-	689	-	-	685	-	-	684	-	-
	⑦MG(μ Sv/h)*2	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4
	③WG(μ Sv/h)*3	46.4	-	-	45.8	-	-	45.8	-	-	45.3	-	-	45.3	-	-	44.8	-	-	44.7	-	-	44.3	-	-
wind direction		S	SE	SSE	ESE	E	E	SE	SE	SSE	E	SE	SE	ESE	SE	E	SE	E	E	E	SE	SE	E	E	E
wind speed (m/s)		1.0	1.0	0.7	1.2	1.4	1.1	0.9	1.0	1.1	1.1	1.1	1.6	2.1	1.5	1.3	1.3	1.7	1.7	1.4	1.3	1.4	1.9	1.9	2.0



Dose Rate in the Fukushima Dai－ichi NPS
μSv/h
（Measured by monitoring car）
Near West Gate
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
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
April 7th
April 8th

Fukushima Dai－ichi NPS

as of 10:00, April 8th, 2011



Fukushima Dai-ni (TEPCO's Monitaring Post)

April 8, 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(μ Sv/h)	3.690	3.683	3.675	3.695	3.685	3.686	3.680	3.676	3.684	3.684	3.672	3.680	3.675	3.669	3.681	3.657	3.663	3.669	3.668	3.677	3.665	3.661	3.668	3.656
MP2(μ Sv/h)	2.701	2.689	2.692	2.689	2.694	2.684	2.681	2.688	2.677	2.687	2.682	2.679	2.678	2.670	2.693	2.685	2.687	2.688	2.687	2.688	2.688	2.674	2.682	2.680
MP3(μ Sv/h)	3.966	3.980	3.976	3.976	3.964	3.961	3.959	3.977	3.962	3.974	3.955	3.951	3.958	3.947	3.944	3.947	3.948	3.950	3.961	3.940	3.957	3.953	3.946	3.936
MP4(μ Sv/h)	3.017	3.030	3.020	3.021	3.016	3.020	3.013	3.010	3.017	3.018	3.013	2.999	3.013	3.022	3.020	3.026	3.006	3.008	3.016	3.009	3.010	3.007	3.011	3.010
MP5(μ Sv/h)	2.979	2.971	2.979	2.982	2.965	2.986	2.962	2.963	2.973	2.967	2.974	2.974	2.957	2.961	2.954	2.950	2.958	2.968	2.968	2.952	2.965	2.965	2.957	2.943
MP6(μ Sv/h)	2.959	2.956	2.961	2.948	2.966	2.948	2.956	2.951	2.959	2.948	2.949	2.945	2.940	2.947	2.944	2.948	2.939	2.943	2.943	2.957	2.942	2.947	2.947	2.940
MP7(μ Sv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	SSW	SSW	SSW	SW	SSW	SW	SSW	SSW	SW	SW	SW	WSW	WSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
wind speed (m/s)	8.0	6.6	5.1	4.4	6.9	8.6	7.1	6.5	6.7	6.0	5.1	5.2	5.3	5.2	6.3	7.6	8.9	6.5	8.3	8.0	8.4	7.9	5.0	6.1

*1: NM: Not measured due to the malfunction

April 8, 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(μ Sv/h)	3.670	3.659	3.667	3.653	3.648	3.653	3.658	3.657	3.661	3.661	3.657	3.658	3.654	3.665	3.656	3.653	3.655	3.658	3.643					
MP2(μ Sv/h)	2.685	2.691	2.689	2.676	2.681	2.678	2.670	2.660	2.675	2.688	2.672	2.669	2.680	2.677	2.678	2.673	2.669	2.683	2.679					
MP3(μ Sv/h)	3.946	3.947	3.929	3.942	3.951	3.931	3.950	3.934	3.927	3.954	3.935	3.919	3.934	3.935	3.939	3.916	3.924	3.927	3.914					
MP4(μ Sv/h)	2.994	3.013	2.999	3.002	3.001	2.992	3.000	3.002	2.996	2.991	2.993	3.005	2.979	3.000	2.988	2.999	2.987	3.001	2.999					
MP5(μ Sv/h)	2.952	2.958	2.936	2.969	2.951	2.949	2.935	2.935	2.945	2.950	2.951	2.947	2.947	2.944	2.952	2.944	2.934	2.941	2.948					
MP6(μ Sv/h)	2.946	2.936	2.920	2.941	2.934	2.943	2.935	2.931	2.924	2.931	2.935	2.931	2.920	2.942	2.930	2.928	2.929	2.923	2.928					
MP7(μ Sv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1					
wind direction	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	S	S	S					
wind speed (m/s)	6.6	6.7	7.9	8.8	8.4	8.0	5.8	4.6	3.8	4.6	4.1	4.3	4.4	4.1	3.8	5.6	8.2	10.1	5.5					

April 8, 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(μ Sv/h)																								
MP2(μ Sv/h)																								
MP3(μ Sv/h)																								
MP4(μ Sv/h)																								
MP5(μ Sv/h)																								
MP6(μ Sv/h)																								
MP7(μ Sv/h)																								
wind direction																								
wind speed (m/s)																								

Fukushima Dai-ni (TEPCO's Monitaring Post)

April 7, 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)	3.821	3.795	3.789	3.775	3.785	3.780	3.793	3.780	3.775	3.788	3.810	3.781	3.794	3.797	3.785	3.776	3.785	3.771	3.785	3.770	3.765	3.763	3.742	3.741
MP2(μSv/h)	2.781	2.781	2.783	2.784	2.784	2.782	2.778	2.776	2.779	2.780	2.782	2.778	2.784	2.783	2.780	2.772	2.794	2.771	2.780	2.769	2.766	2.769	2.765	2.760
MP3(μSv/h)	4.079	4.085	4.080	4.072	4.091	4.079	4.060	4.057	4.079	4.071	4.063	4.076	4.079	4.079	4.077	4.069	4.068	4.074	4.089	4.063	4.072	4.080	4.050	4.051
MP4(μSv/h)	3.106	3.106	3.099	3.094	3.105	3.097	3.096	3.097	3.112	3.105	3.105	3.112	3.120	3.126	3.114	3.111	3.107	3.102	3.094	3.103	3.107	3.098	3.112	3.106
MP5(μSv/h)	3.065	3.073	3.056	3.040	3.074	3.056	3.047	3.071	3.068	3.040	3.043	3.047	3.042	3.052	3.047	3.034	3.036	3.014	3.018	3.032	3.022	3.035	3.019	3.031
MP6(μSv/h)	3.045	3.062	3.047	3.049	3.036	3.034	3.029	3.064	3.061	3.042	3.044	3.047	3.049	3.066	3.056	3.062	3.050	3.044	3.051	3.056	3.037	3.022	3.035	3.030
MP7(μSv/h)	2.210	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	S	S	S	S	S	S	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	SSE
wind speed (m/s)	9.5	10.4	8.4	9.2	9.0	9.4	8.3	8.1	6.6	7.5	7.3	4.1	6.1	6.8	8.2	8.8	8.8	9.3	9.7	10.1	10.3	9.7	9.9	9.3

*1: NM: Not measured due to the malfunction

April 7, 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)	3.745	3.740	3.708	3.716	3.724	3.710	3.719	3.722	3.702	3.700	3.712	3.717	3.712	3.722	3.707	3.714	3.722	3.707	3.716	3.719	3.701	3.716	3.720	3.710
MP2(μSv/h)	2.754	2.749	2.754	2.732	2.723	2.747	2.736	2.721	2.730	2.730	2.718	2.701	2.710	2.725	2.717	2.715	2.719	2.713	2.725	2.713	2.716	2.730	2.707	2.729
MP3(μSv/h)	4.043	4.054	4.025	4.029	4.052	4.019	4.028	4.021	4.018	4.020	4.041	3.991	4.016	4.013	4.008	4.008	4.007	4.018	4.003	4.002	4.009	4.004	4.015	4.018
MP4(μSv/h)	3.098	3.089	3.083	3.078	3.057	3.065	3.030	3.040	3.047	3.037	3.042	3.060	3.048	3.039	3.045	3.040	3.047	3.043	3.047	3.041	3.039	3.052	3.044	3.037
MP5(μSv/h)	3.034	3.010	3.022	3.017	3.016	2.996	3.008	3.013	3.018	2.985	3.003	2.993	2.988	2.985	2.999	2.998	2.984	2.976	2.987	2.989	2.987	2.991	2.977	2.976
MP6(μSv/h)	3.047	3.039	3.042	3.024	3.018	3.011	3.018	3.007	2.993	2.991	3.007	2.963	2.985	2.986	2.950	2.968	2.965	2.969	2.980	2.973	2.962	2.960	2.961	2.970
MP7(μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	S	S	S	S	SSE	SSE	SSE	S	SSE	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	WSW
wind speed (m/s)	11.0	10.9	11.1	10.3	6.9	8.0	8.5	9.0	8.6	8.9	8.1	8.0	9.0	7.7	5.7	5.4	7.4	6.3	5.6	3.5	3.2	3.8	3.6	4.2

April 7, 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)	3.699	3.719	3.707	3.717	3.706	3.718	3.703	3.716	3.715	3.706	3.697	3.704	3.695	3.707	3.701	3.699	3.685	3.702	3.702	3.692	3.693	3.699	3.699	3.684
MP2(μSv/h)	2.713	2.714	2.713	2.711	2.702	2.712	2.719	2.716	2.711	2.729	2.706	2.702	2.703	2.710	2.706	2.708	2.700	2.698	2.701	2.692	2.693	2.697	2.688	2.705
MP3(μSv/h)	4.005	4.015	3.979	4.007	4.011	4.008	4.007	4.006	3.995	3.990	3.990	3.987	4.004	4.000	3.994	3.975	4.003	3.977	3.975	3.987	3.990	3.987	3.980	3.978
MP4(μSv/h)	3.043	3.037	3.043	3.044	3.044	3.037	3.043	3.026	3.047	3.037	3.033	3.041	3.036	3.037	3.041	3.018	3.021	3.016	3.022	3.034	3.040	3.013	3.021	3.028
MP5(μSv/h)	2.992	2.979	2.985	2.987	2.989	3.008	2.991	2.994	2.983	2.995	2.972	2.990	2.976	2.978	2.982	2.975	2.976	2.975	2.977	2.982	2.963	2.978	2.980	2.962
MP6(μSv/h)	2.964	2.954	2.964	2.966	2.972	2.967	2.972	2.973	2.969	2.966	2.949	2.974	2.955	2.959	2.971	2.951	2.958	2.955	2.962	2.954	2.959	2.965	2.959	2.962
MP7(μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	WSW	W	W	W	WSW	WSW	SW	SSW	SSW	SW	SW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
wind speed (m/s)	5.8	6.5	6.6	5.1	3.5	3.7	2.7	2.3	4.4	3.5	3.5	2.3	3.1	4.1	3.5	3.3	4.9	5.3	5.4	7.5	7.6	6.9	8.5	9.2

Fukushima Dai-ni (TEPCO's Monitaring Post)

April 7, 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)	3.852	3.862	3.863	3.850	3.863	3.845	3.851	3.389	3.855	3.849	3.837	3.850	3.840	3.834	3.842	3.836	3.846	3.835	3.841	3.827	3.824	3.843	3.836	3.847
MP2 (μSv/h)	2.831	2.815	2.799	2.808	2.802	2.815	2.808	2.807	2.800	2.804	2.799	2.810	2.809	2.821	2.810	2.806	2.798	2.802	2.798	2.793	2.787	2.804	2.804	2.809
MP3 (μSv/h)	4.172	4.157	4.160	4.175	4.152	4.155	4.144	4.158	4.146	4.158	4.144	4.168	4.157	4.146	4.149	4.151	4.135	4.137	4.146	4.120	4.125	4.144	4.134	4.128
MP4 (μSv/h)	3.171	3.161	3.162	3.144	3.143	3.153	3.155	3.154	3.145	3.153	3.166	3.138	3.146	3.154	3.156	3.160	3.151	3.142	3.142	3.145	3.139	3.133	3.151	3.135
MP5 (μSv/h)	3.108	3.110	3.099	3.107	3.096	3.103	3.097	3.104	3.107	3.093	3.093	3.082	3.099	3.092	3.090	3.074	3.083	3.081	3.076	3.089	3.082	3.079	3.095	3.070
MP6 (μSv/h)	3.078	3.103	3.085	3.086	3.091	3.086	3.074	3.083	3.102	3.088	3.077	3.085	3.077	3.085	3.078	3.082	3.088	3.069	3.080	3.079	3.073	3.069	3.067	3.072
MP7 (μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SSW	SSW	SSW	SW	SW	SSW	SW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW
wind speed (m/s)	6.0	5.5	6.3	6.8	6.9	6.0	7.1	6.5	6.0	5.2	4.1	4.8	4.8	3.4	2.5	0.4	1.9	4.0	4.4	5.0	3.3	3.3	1.8	2.0

*1: NM: Not measured due to the malfunction

April 7, 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)	3.843	3.843	3.845	3.828	3.842	3.827	3.834	3.831	3.821	3.824	3.825	3.822	3.819	3.812	3.818	3.811	3.813	3.801	3.824	3.824	3.814	3.805	3.821	3.819
MP2 (μSv/h)	2.822	2.807	2.809	2.798	2.795	2.812	2.799	2.793	2.796	2.795	2.789	2.779	2.776	2.789	2.803	2.790	2.791	2.787	2.791	2.777	2.775	2.793	2.787	2.782
MP3 (μSv/h)	4.134	4.146	4.137	4.122	4.131	4.136	4.120	4.125	4.115	4.135	4.122	4.112	4.119	4.110	4.117	4.120	4.122	4.106	4.104	4.112	4.107	4.114	4.103	4.112
MP4 (μSv/h)	3.140	3.154	3.124	3.139	3.123	3.131	3.132	3.138	3.136	3.126	3.126	3.120	3.126	3.119	3.130	3.132	3.121	3.132	3.118	3.122	3.128	3.136	3.117	3.136
MP5 (μSv/h)	3.091	3.076	3.086	3.079	3.076	3.065	3.083	3.070	3.067	3.065	3.065	3.068	3.073	3.071	3.054	3.064	3.066	3.077	3.066	3.060	3.075	3.071	3.074	3.061
MP6 (μSv/h)	3.089	3.082	3.070	3.083	3.081	3.078	3.075	3.090	3.063	3.062	3.069	3.072	3.069	3.065	3.070	3.068	3.065	3.068	3.068	3.700	3.068	3.063	3.067	3.053
MP7 (μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	SSW	S	SSW	SSW	SSW	S	SSW	SSW	S	S	S	SSW	SSW	S	S	SSW	SSW	SSW	S	S	SSW	SSW	SSW	S
wind speed (m/s)	3.0	2.5	2.7	3.5	4.1	4.7	5.3	3.8	3.3	3.7	2.5	3.0	3.3	2.3	2.7	4.1	3.1	2.4	2.8	2.2	3.9	3.2	3.7	1.4

April 7, 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)	3.811	3.810	3.810	3.830	3.811	3.812	3.798	3.792	3.818	3.811	3.799	3.811	3.795	3.804	3.796	3.800	3.809	3.808	3.812	3.795	3.807	3.809	3.787	3.788
MP2 (μSv/h)	2.792	2.781	2.784	2.810	2.795	2.807	2.793	2.775	2.797	2.784	2.787	2.789	2.792	2.792	2.780	2.780	2.794	2.779	2.788	2.774	2.791	2.797	2.795	2.791
MP3 (μSv/h)	4.115	4.112	4.110	4.122	4.110	4.106	4.110	4.102	4.117	4.114	4.102	4.098	4.115	4.099	4.099	4.085	4.089	4.089	4.103	4.088	4.089	4.092	4.089	4.082
MP4 (μSv/h)	3.113	3.127	3.139	3.125	3.118	3.122	3.125	3.112	3.120	3.128	3.127	3.134	3.120	3.125	3.140	3.109	3.117	3.114	3.097	3.120	3.119	3.118	3.126	3.114
MP5 (μSv/h)	3.060	3.056	3.062	3.066	3.045	3.067	3.060	3.058	3.071	3.071	3.043	3.058	3.067	3.053	3.071	3.051	3.078	3.066	3.069	3.069	3.062	3.069	3.065	3.071
MP6 (μSv/h)	3.070	3.062	3.055	3.057	3.064	3.052	3.075	3.057	3.066	3.048	3.052	3.069	3.067	3.054	3.055	3.071	3.067	3.048	3.050	3.051	3.052	3.068	3.053	3.065
MP7 (μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	S	SSE	S	SSW	SSW	SSW	S	SSW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
wind speed (m/s)	1.6	1.1	3.9	4.7	4.5	4.2	4.4	5.0	3.3	4.3	6.5	6.3	5.7	6.2	6.6	6.7	8.3	7.1	8.5	9.0	8.9	8.9	9.3	10.1

Fukushima Dai-ni NPS

as of 10:00, April 8th, 2011

Location of Monitoring Post

MP1 : 3.643 μSv/h (as of 7:00 April 8th)
(Ref. Value:0.035～0.054 μSv/h)

MP2 : 2.679 μSv/h (as of 7:00 April 8th)
(Ref. Value:0.042～0.062 μSv/h)

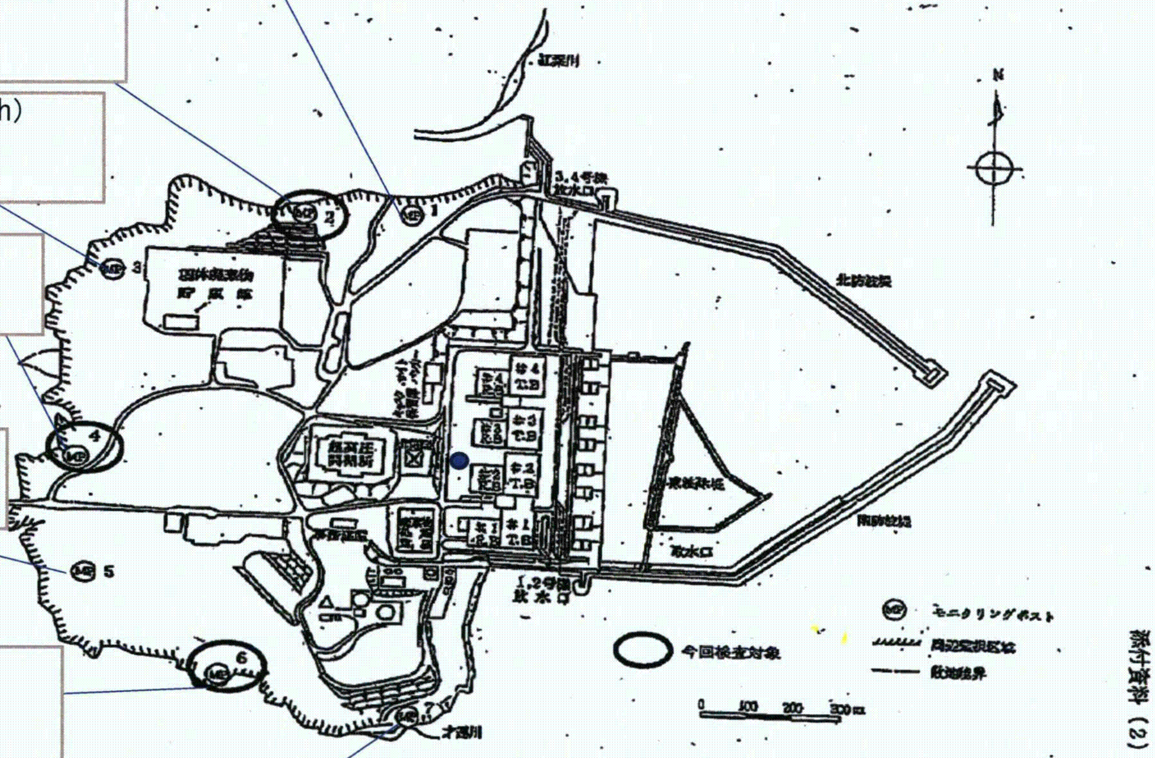
MP3 : 3.914 μSv/h (as of 7:00 April 8th)
(Ref. Valur:0.036～0.052 μSv/h)

MP4 : 2.999 μSv/h (as of 7:00 April 8th)
(Ref. value: 0.036～0.052 μSv/h)

MP5 : 2.948 μSv/h (as of 7:00 April 8th)
(Ref. Value:0.041～0.058 μSv/h)

MP6 : 2.928 μSv/h (as of 7:00 April 8th)
(Ref. value:0.044～0.063 μSv/h)

MP7 : 2.210 μSv/h (as of 12:00 April 7th)
(Ref. Value: 0.043～0.062 μSv/h)



添付資料(2)

Results of environmental monitoring at each NPSs etc. (as of 9pm April 7th, 2011)

unit: μ Sv/h

Range of normal average value	Company	NPS	April 7, 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	0.029	0.029	0.028	0.028	0.028	0.028	0.028	0.028	0.029	0.029	0.029	0.029
0.024～0.060	Tohoku Electric Power Co.	Onagawa NPS	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
0.012～0.060		Higashidori NPS	0.017	0.017	0.017	0.016	0.016	0.017	0.017	0.017	0.017	0.017	0.017	0.017
0.033～0.050	Tokyo Electric Power Co.	Fukushima Dai-ichi※	59.4	61.3	59.3	59.0	59.4	60.6	58.5	58.5	58.5	58.4	58.2	58.0
0.036～0.052		Fukushima Dai-ni	4.172	4.144	4.157	4.146	4.134	4.120	4.119	4.104	4.115	4.110	4.115	4.103
0.011～0.159		Kashiwazaki kariwa NPS	0.066	0.067	0.065	0.066	0.066	0.066	0.067	0.066	0.066	0.066	0.066	0.066
0.036～0.053	Japan Atomic Power Co.	Tokai Dai-ni NPS	0.463	0.459	0.457	0.460	0.457	0.456	0.459	0.456	0.460	0.456	0.458	0.458
0.039～0.110		Tsuruga NPS	0.076	0.075	0.075	0.076	0.075	0.075	0.075	0.075	0.075	0.074	NM *1	NM *1
0.064～0.108	Chubu Electric Power Co.	Hamaoka NPS	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
0.0207～0.132	Hokuriku Electric Power Co.	Shika NPS	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.033	0.033
0.028～0.130	Chugoku Electric Power Co.	Shimane NPS	0.029	0.030	0.029	0.030	0.030	0.031	0.030	0.030	0.031	0.031	0.029	0.029
0.070～0.077	Kansai Electric Power Co.	Mihama NPS	0.074	0.074	0.074	0.074	0.072	0.074	0.075	0.074	0.075	0.074	0.073	0.073
0.045～0.047		Takahama NPS	0.042	0.043	0.043	0.043	0.042	0.042	0.042	0.042	0.043	0.043	0.042	0.042
0.036～0.040		Ooi NPS	0.036	0.036	0.036	0.035	0.035	0.036	0.036	0.036	0.034	0.035	0.034	0.033
0.011～0.080	Shikoku Electeic Power Co.	Ikata NPS	0.013	0.014	0.013	0.013	0.013	0.013	0.013	0.014	0.013	0.013	0.014	0.013
0.023～0.087	Kyushu Electric Power Co.	Genkai NPS	0.026	0.026	0.026	0.026	0.024	0.026	0.027	0.028	0.027	0.027	0.027	0.025
0.034～0.120		Sendai NPS	0.041	0.038	0.038	0.039	0.039	0.038	0.038	0.041	0.037	0.037	0.035	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	0.016	0.017	0.017	0.017	0.016
0.009～0.071		Japan Nuclear Fuel Plant Disposal	0.023	0.023	0.022	0.022	0.022	0.022	0.023	0.022	0.023	0.023	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

Range of normal average value	Company	NPS	April 7, 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	0.029	0.028	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029		
0.024～0.060	Tohoku Electric Power Co.	Onagawa NPS	0.38	0.38	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37		
0.012～0.060		Higashidori NPS	0.017	0.018	0.018	0.017	0.018	0.018	0.017	0.017	0.017	0.017		
0.033～0.050	Tokyo Electric Power Co.	Fukushima Dai-ichi※	58.0	57.7	57.6	57.4	57.1	56.8	56.8	56.6	56.7	56.5		
0.036～0.052		Fukushima Dai-ni	4.079	4.060	4.079	4.089	4.043	4.028	4.016	4.003	4.005	4.007		
0.011～0.159		Kashiwazaki kariwa NPS	0.066	0.066	0.066	0.065	0.066	0.066	0.066	0.065	0.067	0.067		
0.036～0.053	Japan Atomic Power Co.	Tokai Dai-ni NPS	0.457	0.456	0.459	0.456	0.454	0.454	0.455	0.454	0.448	0.450		
0.039～0.110		Tsuruga NPS	NM *1	NM *1	NM *1	NM *1	NM *1	0.075	0.075	0.076	0.075	0.076		
0.064～0.108	Chubu Electric Power Co.	Hamaoka NPS	0.046	0.045	0.045	0.045	0.045	0.045	0.044	0.045	0.045	0.045		
0.0207～0.132	Hokuriku Electric Power Co.	Shika NPS	0.033	0.033	0.033	0.033	0.033	0.033	0.034	0.034	0.034	0.034		
0.028～0.130	Chugoku Electric Power Co.	Shimane NPS	0.029	0.029	0.030	0.031	0.031	0.030	0.030	0.029	0.030	0.030		
0.070～0.077	Kansai Electric Power Co.	Mihama NPS	0.074	0.075	0.075	0.073	0.075	0.072	0.074	0.074	0.074	0.073		
0.045～0.047		Takahama NPS	0.043	0.043	0.043	0.042	0.042	0.042	0.043	0.043	0.043	0.043		
0.036～0.040		Ooi NPS	0.034	0.034	0.034	0.034	0.034	0.033	0.034	0.034	0.034	0.034		
0.011～0.080	Shikoku Electeic Power Co.	Ikata NPS	0.013	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013		
0.023～0.087	Kyushu Electric Power Co.	Genkai NPS	0.026	0.027	0.026	0.026	0.027	0.026	0.026	0.025	0.026	0.026		
0.034～0.120		Sendai NPS	0.037	0.036	0.038	0.038	0.037	0.038	0.038	0.037	0.039	0.035		
0.009～0.069	Japan Nuclear Fuel Limited	Japan Nuclear Fuel Reprocessing Plant	0.016	0.016	0.016	0.016	0.017	0.017	0.016	0.016	0.016	0.016		
0.009～0.071		Japan Nuclear Fuel Plant Disposal	0.023	0.023	0.022	0.023	0.022	0.023	0.023	0.023	0.022	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

*1: NM: Not measured because of inspection

Fukushima Dai-ichi Nuclear Power Station Major Parameters of the Plant (As of 13:00, April 6th)

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 : 6 m^3/h (As of 17:30, April 3rd) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water : 8 m^3/h (As of 12:12, April 3rd) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water: 7 m^3/h (As of 17:32, April 3rd) temporary measuring instrument	Under shutdown	Under shutdown	Under shutdown
Reactor water level	Fuel range A : -1,650mm Fuel range B : -1,650mm (As of 12:00, April 6th)	Fuel range A : -1,500mm (As of 12:00, April 6th)	Fuel range A:-1,800mm Fuel range B:-2,200mm (As of 12:30, April 6th)	#2	Shutdown range measurement 1,965mm (As of 13:00, April 6th)	Shutdown range measurement 1,791mm (As of 13:00, April 6th)
Reactor pressure	0.313MPa g(A) 0.653MPa g(B) (As of 12:00, April 6th)	-0.016MPa g (A) -0.018MPa g (D) (As of 12:00,April 6th)	0.005MPa g (A) -0.086MPa g (C) (As of 12:30, April 6th)	#2	0.005MPa g (As of 13:00, April 6th)	0.005MPa g (As of 13:00, April 6th)
Reactor water temperature	(Impossible collection due to low system flow rate)			#2	42.3℃ (As of 13:00, April 6th)	21.1℃ (As of 13:00, April 6th)
Reactor Pressure Vessel (RPV) temperature	Feedwater nozzle temperature: 214.0℃ Temperature at the bottom head of RPV: 115.0℃ (As of 12:00, April 6th)	Feedwater nozzle temperature: 142.5℃ Temperature at the bottom head of RPV: #1 (As of 12:00, April 6th)	Feedwater nozzle temperature: 78.8℃ (under survey) Temperature at the bottom head of RPV: 115.0℃ (As of 12:30, April 6th)	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: 0.150MPa abs S/C: 0.150MPa abs (As of 12:00, April 6th)	D/W: 0.100MPa abs S/C:Down scale (under survey) (As of 12:00, April 6th)	D/W: 0.1069MPa abs S/C: 0.1731MPa abs (As of 12:30, April 6th)	#2		
CAMS*3	D/W: 3.10×10^{1}Sv/h S/C: 8.01×10^{0}Sv/h (As of 12:00, April 6th)	D/W: 3.11×10^{1}Sv/h S/C: 8.25×10^{-1}Sv/h (As of 12:00,April 6th)	D/W: 1.95×10^{1}Sv/h S/C: 7.99×10^{-1}Sv/h (As of 12:30, April 6th)	#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	51.0℃ (As of 12:00, April 6th)	#1	#1	35.2℃ (As of 13:00, April 6th)	29.5℃ (As of 13:00, April 6th)
FPC skimmer level	4,500mm (As of 12:00, April 6th)	5,600mm (As of 12:00, April 6th)	#1	4,900mm (As of 12:30, April 6th)	#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	Common pool: about 27 ℃ (As of 8:00, April 6th)	Unit5: Supplemental Fuel Pool Cooling mode (From 9:52 April 6th)	Unit6: SHC*5 mode (From 20:06 April 5th)

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

経済産業省
Ministry of Economy, Trade and Industry

April 8, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 80th Release)
(As of 08:00 April 8th, 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
  - Water spray of around 38t of fresh water for Unit 4 using Concrete Pump Truck (50t/h) was carried out. (From 18:23 till 19:40 April 7th)

2. Other injuries
   - On the afternoon of 7 April, a worker who was making sandbags at the soil disposal yard (spoil bank) on the north side of Fukushima Dai-ichi NPS got sick and was transported to J-Village for the body survey of contamination of radioactive materials. Being confirmed to be free from contamination, he was taken to the Iwaki City Kyouritsu Hospital by ambulance.

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

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(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 06:00 April 8th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.491(A) 0.889(B)	0.090(A) 0.085(D)	0.099(A) 0.020(C)	—	0.103	0.104
CV Pressure (D/W) [kPa]	180	100	106.1	—	—	—
Reactor Water Level*2 [mm]	-1,650(A) -1,650(B)	-1,500(A) Not available(B)	-2,000(A) -2,250(B)	—	1,669	1,691
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	150	down scale (under survey)	172.6	—	—	—
Spent Fuel Pool Water Temperature [℃]	Indicator Failure	63.0	Indicator Failure	Indicator Failure	34.8	28.0
Time of Measurement	0:00 April 8th	3:00 April 8th	01:30 April 8th	April 8th	06:00 April 8th	06:00 April 8th

*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 8th)
- Fresh water injection to RPV is being carried out. (As of <u>08:00</u> April 8th)

<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 measurements 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 8th)
- Fresh water injection to RPV is being carried out. (As of 08:00 April 8th)

<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 8th)
- Fresh water injection to RPV is being carried out. (As of 08:00 April 8th)

<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 of around 20t using Concrete Pump Truck (50t/h) was carried out. (From 17:35 till 18:22 April 5th)
- Fresh water spray of around 38t using Concrete Pump Truck (50t/h) was carried out. (From 18:23 till 19:40 April 7th)
- White smoke was confirmed to generate continuously. (As of 06:30 April 8th)

<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, 7.4×10^1Bq/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, 4.6×10^1Bq/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 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 (Around 10,000t) 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 outflow of the contaminated water 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 prevents 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 06:00 April 8th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.14	0.10	0.17
Reactor water temperature	℃	25.1	25.0	34.7	30.3
Reactor water level*2	mm	9,346	10,346	7,810	8,785
Suppression pool water temperature	℃	23	24	26	31
Suppression pool pressure	kPa (abs)	105	106	111	110
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.

(April 7th)

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

< Possibility on radiation exposure (As of 08:00 April 8th) >

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 6th, the screening was done to 133,972 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 8th)>

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.)
- 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.)
- 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.)
- On the afternoon of 7 April, a worker who was making sandbags at the soil disposal yard (spoil bank) on the north side of Fukushima Dai-ichi NPS got sick and was transported to J-Village for the body survey of contamination of radioactive materials. Being confirmed to be free from contamination, he was taken to the Iwaki City Kyouritsu Hospital by ambulance.

<Situation of resident evacuation (As of 08:00 April 8th)>

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 8th)

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**	
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 8th)

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)
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Phone:+81-(0)3-3501-1087

April 8th, 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 westsouthwest 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)	54.5	54.3	54.4	54.3	54.1	54.4	54.3	54.2	54.3	54.4	54.2	54.2	54.4	54.3	54.2	54.1	54.3	54.1	54.1					
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
TM	⑥SMOB(μSv/h)*1	650	–	–	651	–	–	649	–	–	647	–	–	648	–	–	648	–	–	645					
	⑦MG(μSv/h)*2	95	–	–	96	–	–	98	–	–	95	–	–	96	–	–	95	–	–	94					
	③WG(μSv/h)*3	41.0	–	–	40.0	–	–	41.0	–	–	40.0	–	–	40.0	–	–	40.0	–	–	40.0					
wind direction		SE	SE	SE	SSE	SSE	E	SE	SW	NNW	SW	WNW	NE	S	N	N	NW	NNW	N	W					
wind speed (m/s)		2.1	1.5	2.0	2.1	1.5	1.7	1.6	1.2	1.3	0.9	1.1	1.1	1.4	1.2	1.1	1.2	0.8	1.2	0.9					

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate
*4: NM: Not measured due to the malfunction

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)																									

Monitoring Post (as of 15:00)

※Check readings once a day

Monitoring Poists	MP-1	MP-2	MP-3	MP-4	MP-5	MP-6	MP-7	MP-8
Reading (μSv/h)	14	45	45	45	89	130	270	220

※As for MP-1 and 2, readings were observed by human eyes (Coulc not be transmitted because of system trouble)
※As for MP-3 to 8, readings were transmitted by system

April 8th, 2011

Fukushima Dai-ichi Monitoring points

① North side of main office building(approx. 0.5km from Unit 2 in northwest direction)
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④ Front of near Main Gate (near MP-6) (approx. 1.0km from Unit 2 in westsouthwest 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(μ Sv/h)	56.0	56.0	56.1	56.1	56.2	56.0	56.0	55.7	55.7	55.6	55.5	55.6	55.5	55.6	55.6	55.6	55.5	55.4	55.4	55.4	55.3	55.3	55.3	55.2
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	681	-	-	683	-	-	685	-	-	684	-	-	675	-	-	682	-	-	679	-	-	679	-	-
	⑦MG(μ Sv/h)*2	99	-	-	97	-	-	97	-	-	98	-	-	97	-	-	98	-	-	97	-	-	97	-	-
	③WG(μ Sv/h)*3	43.3	-	-	43.5	-	-	43.4	-	-	43.1	-	-	43.1	-	-	43.4	-	-	43.2	-	-	43.2	-	-
wind direction		WNW	SW	SSE	W	W	W	W	WNW	N	N	WNW	W	W	N	SE	SSE	SE	SSE	SSE	SE	SSE	S	W	SE
wind speed (m/s)		0.4	0.6	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.5	0.8	0.9	0.9	1.0	1.0	0.4	0.5	0.5	0.4

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate
*4: NM: Not measured due to the malfunction

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(μ Sv/h)	55.2	55.2	55.3	55.3	55.3	55.1	55.2	55.2	55.1	55.1	55.1	55.1	55.1	55.0	55.0	55.1	55.1	55.1	55.0	55.1	55.0	55.0	55.1	54.9
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	675	-	-	676	-	-	676	-	-	677	-	-	677	-	-	676	-	-	676	-	-	676	-	-
	⑦MG(μ Sv/h)*2	95	-	-	97	-	-	97	-	-	96	-	-	97	-	-	97	-	-	96	-	-	97	-	-
	③WG(μ Sv/h)*3	43.1	-	-	43.1	-	-	42.8	-	-	43.0	-	-	42.9	-	-	43.0	-	-	43.0	-	-	43.0	-	-
wind direction		E	W	W	W	WNW	W	S	SSE	SE	S	SSE	SE	W	SSW	SE	ESE	SE	ESE	ESE	ESE	ESE	E	E	E
wind speed (m/s)		0.3	0.8	0.8	0.6	0.6	0.7	0.7	0.8	1.0	0.6	1.0	0.7	0.5	0.6	0.7	0.9	0.9	1.3	1.5	2.0	1.7	1.5	1.8	2.1

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(μ Sv/h)	54.8	54.9	54.8	55.0	54.8	54.7	54.8	55.0	54.8	54.8	54.8	55.0	54.7	54.7	54.6	54.5	54.6	54.5	54.6	54.5	54.5	54.5	54.4	54.4
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μ Sv/h)*1	672	-	-	673	-	-	669	-	-	667	-	-	664	-	-	660	-	-	657	-	-	654	-	-
	⑦MG(μ Sv/h)*2	98	-	-	97	-	-	96	-	-	97	-	-	95	-	-	95	-	-	96	-	-	95	-	-
	③WG(μ Sv/h)*3	43.0	-	-	43.0	-	-	42.0	-	-	42.0	-	-	42.0	-	-	42.0	-	-	41.0	-	-	41.0	-	-
wind direction		ESE	SSW	ESE	ESE	ESE	E	ESE	ESE	SSE	SSW	SSW	WSW	SSW	SW	SW	W	S	SE	SE	SE	SE	SE	SE	SE
wind speed (m/s)		1.3	1.1	1.6	1.8	2.1	2.1	2.1	1.6	1.4	1.3	1.5	1.2	1.5	1.3	1.1	1.4	1.2	1.6	2.0	2.3	2.2	2.1	2.3	2.3

April 7th, 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 westsouthwest 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)	58.0	57.9	57.8	57.9	57.8	57.7	57.7	57.6	57.7	57.6	57.6	57.7	57.6	57.7	57.6	57.5	57.4	57.6	57.4	57.5	57.3	57.3	57.3	57.3
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μSv/h)*1	679	-	-	672	-	-	677	-	-	679	-	-	677	-	-	673	-	-	671	-	-	667	-	-
	⑦MG(μSv/h)*2	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4
	③WG(μSv/h)*3	44.2	-	-	43.8	-	-	43.8	-	-	43.5	-	-	43.7	-	-	43.4	-	-	43.0	-	-	42.9	-	-
wind direction		E	SE	NE	SE	E	E	E	E	E	E	E	ESE	E	E	NE	SE	E	SE	E	SE	ESE	E	E	E
wind speed (m/s)		1.8	1.8	2.3	2.2	1.8	1.6	1.6	1.5	1.6	2.1	2.2	2.1	1.9	1.8	1.8	1.6	1.5	1.9	1.5	2.6	2.6	2.9	2.0	2.2

*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate
*4: NM: Not measured due to the malfunction

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)	57.1	57.2	57.1	57.1	57.1	57.1	56.8	57.0	56.9	56.7	56.9	56.8	56.8	56.9	56.8	56.8	56.7	56.7	56.6	56.8	56.7	56.7	56.7	56.7
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μSv/h)*1	671	-	-	668	-	-	665	-	-	667	-	-	669	-	-	668	-	-	676	-	-	675	-	-
	⑦MG(μSv/h)*2	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	101	-	-	98	-	-	99	-	-	100	-	-	101	-	-	98	-	-
	③WG(μSv/h)*3	43.0	-	-	42.7	-	-	42.6	-	-	42.6	-	-	42.3	-	-	42.8	-	-	42.8	-	-	42.7	-	-
wind direction		E	ESE	E	E	E	SE	E	ESE	W	S	E	N	E	S	SW	S	SW	NW	SSE	S	N	WNW	SSW	SSW
wind speed (m/s)		1.9	2.1	1.8	1.7	1.5	1.3	1.3	1.1	0.8	0.9	0.8	0.5	0.4	0.5	0.5	0.5	0.4	0.3	0.5	0.4	0.7	0.4	0.2	0.5

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)	56.7	56.7	56.5	56.6	56.5	56.6	56.5	56.5	56.5	56.4	56.5	56.5	56.5	56.4	56.2	56.3	56.3	56.2	56.3	56.1	56.2	56.1	56.1	56.1
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μSv/h)*1	674	-	-	678	-	-	679	-	-	680	-	-	684	-	-	683	-	-	685	-	-	681	-	-
	⑦MG(μSv/h)*2	98	-	-	100	-	-	100	-	-	99	-	-	98	-	-	99	-	-	99	-	-	98	-	-
	③WG(μSv/h)*3	42.6	-	-	43.3	-	-	43.2	-	-	43.0	-	-	43.0	-	-	43.2	-	-	43.3	-	-	43.2	-	-
wind direction		WNW	SW	WNW	WNW	NW	ESE	N	WNW	E	SSW	WSW	WNW	W	WSW	ESE	S	WSW	SSW	WNW	W	WSW	W	SW	SSW
wind speed (m/s)		0.6	0.6	0.8	0.7	0.3	0.5	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.3	0.4	0.5	0.4	0.4	0.5	0.6	0.5

Monitoring Post (as of 15:00)

※Check readings once a day

Monitoring Poists	MP-1	MP-2	MP-3	MP-4	MP-5	MP-6	MP-7	MP-8
Reading (μSv/h)	15	45	47	47	95	140	280	230

※As for MP-1 and 2, readings were observed by human eyes (Coulc not be transmitted because of system trouble)
※As for MP-3 to 8, readings were transmitted by system

2011/4/9 13:41

April 7th, 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 westsouthwest 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)	59.4	59.4	59.3	59.4	59.3	59.5	61.3	59.9	59.7	59.6	59.3	59.3	59.3	59.2	59.3	59.2	59.2	59.2	59.0	59.0	58.7	59.2	59.2	59.5
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μSv/h)*1	713	–	–	716	–	–	709	–	–	712	–	–	710	–	–	709	–	–	712	–	–	708	–	–
	⑦MG(μSv/h)*2	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–
	③WG(μSv/h)*3	46.6	–	–	46.7	–	–	48.0	–	–	46.8	–	–	46.7	–	–	46.6	–	–	46.8	–	–	46.9	–	–
wind direction		NE	W	SE	WNW	E	W	W	W	SE	WNW	W	NW	WSW	WNW	WNW	N	NNW	NW	NE	SW	W	W	NNW	E
wind speed (m/s)		0.3	0.4	0.2	0.3	0.6	0.3	0.3	0.3	0.4	0.7	0.6	0.6	0.6	0.6	0.4	0.6	0.7	0.8	0.6	0.4	0.6	0.5	0.4	0.3

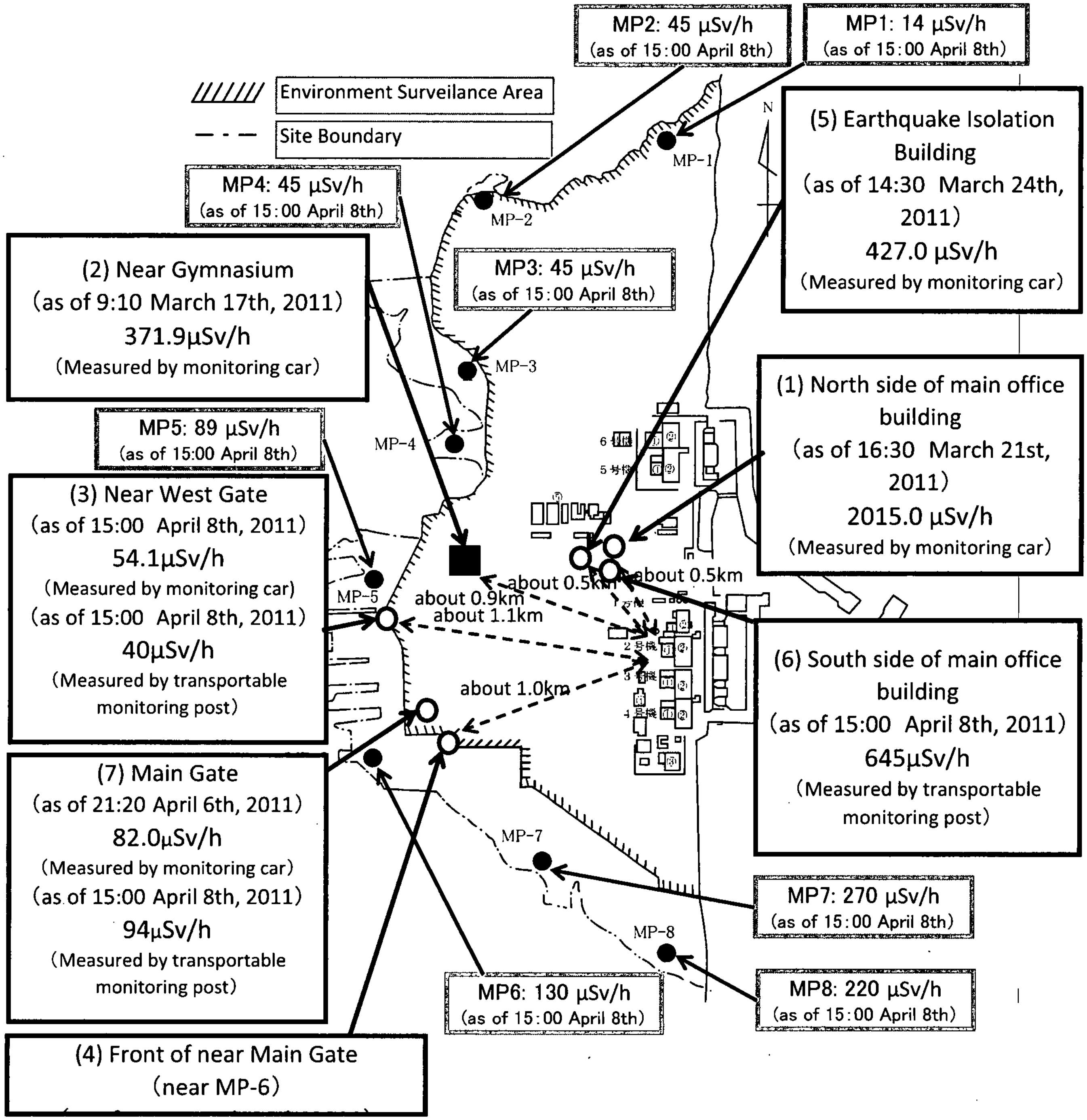
*1: SMOB : South Side of Main Office Building
*2: MG: Main Gate
*3: WG:West Gate
*4: NM: Not measured due to the malfunction

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)	59.4	59.7	60.1	60.5	59.2	59.5	60.6	60.1	58.8	58.6	58.6	58.5	58.5	58.5	58.5	58.4	58.6	58.6	58.5	58.5	58.4	58.6	58.4	58.4
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μSv/h)*1	708	–	–	712	–	–	711	–	–	708	–	–	709	–	–	708	–	–	706	–	–	709	–	–
	⑦MG(μSv/h)*2	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–	NM *4	–	–
	③WG(μSv/h)*3	47.0	–	–	47.9	–	–	48.0	–	–	46.4	–	–	46.5	–	–	46.7	–	–	46.4	–	–	46.2	–	–
wind direction		SSE	WNW	W	SE	NE	N	NNE	W	W	W	SW	W	W	SW	W	W	WSW	SW	W	WSW	SW	SW	SE	ESE
wind speed (m/s)		0.5	0.4	0.2	0.6	0.4	0.4	0.3	0.5	0.5	0.6	0.4	0.7	0.8	0.6	0.5	0.5	0.5	0.2	0.4	0.4	0.4	0.5	0.7	0.8

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)	58.5	58.5	58.4	58.5	58.4	58.4	58.4	58.4	58.3	58.3	58.3	58.2	58.2	58.2	58.2	58.2	58.0	58.2	58.0	58.1	58.0	58.0	57.9	57.9
	neutron	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TM	⑥SMOB(μSv/h)*1	710	–	–	706	–	–	700	–	–	698	–	–	692	–	–	689	–	–	685	–	–	684	–	–
	⑦MG(μSv/h)*2	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4	NM *4
	③WG(μSv/h)*3	46.4	–	–	45.8	–	–	45.8	–	-	45.3	–	–	45.3	–	–	44.8	–	–	44.7	–	–	44.3	–	–
wind direction		S	SE	SSE	ESE	E	E	SE	SE	SSE	E	SE	SE	ESE	SE	E	SE	E	E	E	SE	SE	E	E	E
wind speed (m/s)		1.0	1.0	0.7	1.2	1.4	1.1	0.9	1.0	1.1	1.1	1.1	1.6	2.1	1.5	1.3	1.3	1.7	1.7	1.4	1.3	1.4	1.9	1.9	2.0

Fukushima Dai－ichi NPS

as of 17:00, April 8th, 2011



Fukushima Dai-ni (TEPCO's Monitaring Post)

April 8, 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)	3.656	3.650	3.651	3.653	3.644	3.623	3.648	3.618	3.614	3.618	3.618	3.629	3.629	3.612	3.593	3.595	3.587	3.608	3.590					
MP2(μSv/h)	2.679	2.678	2.671	2.672	2.667	2.663	2.673	2.658	2.672	2.657	2.664	2.664	2.664	2.648	2.657	2.651	2.646	2.653	2.658					
MP3(μSv/h)	3.892	3.900	3.913	3.900	3.885	3.906	3.901	3.898	3.901	3.899	3.891	3.875	3.875	3.894	3.870	3.882	3.873	3.864	3.856					
MP4(μSv/h)	3.026	3.019	3.027	3.007	3.005	3.014	2.998	2.996	2.996	3.002	3.003	2.990	2.965	2.974	2.962	2.985	2.969	2.962	2.968					
MP5(μSv/h)	2.945	2.922	2.920	2.920	2.926	2.929	2.915	2.918	2.917	2.916	2.908	2.907	2.899	2.898	2.900	2.905	2.909	2.895	2.904					
MP6(μSv/h)	2.924	2.932	2.932	2.909	2.917	2.920	2.911	2.904	2.908	2.899	2.918	2.903	2.895	2.911	2.899	2.899	2.885	2.886	2.882					
MP7(μSv/h)	2.070	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1					
wind direction	S	S	S	S	S	S	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW					
wind speed (m/s)	13.5	15.5	13.0	13.4	14.6	14.0	12.8	10.8	9.6	9.8	10.5	11.9	8.8	6.9	4.7	5.5	3.1	4.7	2.7					

*1: NM: Not measured due to the malfunction

April 8, 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 8, 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 8, 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)	3.690	3.683	3.675	3.695	3.685	3.686	3.680	3.676	3.684	3.684	3.672	3.680	3.675	3.669	3.681	3.657	3.663	3.669	3.668	3.677	3.665	3.661	3.668	3.656
MP2(μSv/h)	2.701	2.689	2.692	2.689	2.694	2.684	2.681	2.688	2.677	2.687	2.682	2.679	2.678	2.670	2.693	2.685	2.687	2.688	2.687	2.688	2.688	2.674	2.682	2.680
MP3(μSv/h)	3.966	3.980	3.976	3.976	3.964	3.961	3.959	3.977	3.962	3.974	3.955	3.951	3.958	3.947	3.944	3.947	3.948	3.950	3.961	3.940	3.957	3.953	3.946	3.936
MP4(μSv/h)	3.017	3.030	3.020	3.021	3.016	3.020	3.013	3.010	3.017	3.018	3.013	2.999	3.013	3.022	3.020	3.026	3.006	3.008	3.016	3.009	3.010	3.007	3.011	3.010
MP5(μSv/h)	2.979	2.971	2.979	2.982	2.965	2.986	2.962	2.963	2.973	2.967	2.974	2.974	2.957	2.961	2.954	2.950	2.958	2.968	2.968	2.952	2.965	2.965	2.957	2.943
MP6(μSv/h)	2.959	2.956	2.961	2.948	2.966	2.948	2.956	2.951	2.959	2.948	2.949	2.945	2.940	2.947	2.944	2.948	2.939	2.943	2.943	2.957	2.942	2.947	2.947	2.940
MP7(μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	SSW	SSW	SSW	SW	SSW	SW	SSW	SSW	SW	SW	SW	WSW	WSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
wind speed (m/s)	8.0	6.6	5.1	4.4	6.9	8.6	7.1	6.5	6.7	6.0	5.1	5.2	5.3	5.2	6.3	7.6	8.9	6.5	8.3	8.0	8.4	7.9	5.0	6.1

*1: NM: Not measured due to the malfunction

April 8, 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)	3.670	3.659	3.667	3.653	3.648	3.653	3.658	3.657	3.661	3.661	3.657	3.658	3.654	3.665	3.656	3.653	3.655	3.658	3.643	3.646	3.658	3.650	3.636	3.649
MP2(μSv/h)	2.685	2.691	2.689	2.676	2.681	2.678	2.670	2.660	2.675	2.688	2.672	2.669	2.680	2.677	2.678	2.673	2.669	2.683	2.679	2.674	2.677	2.683	2.672	2.669
MP3(μSv/h)	3.946	3.947	3.929	3.942	3.951	3.931	3.950	3.934	3.927	3.954	3.935	3.919	3.934	3.935	3.939	3.916	3.924	3.927	3.914	3.944	3.925	3.919	3.922	3.915
MP4(μSv/h)	2.994	3.013	2.999	3.002	3.001	2.992	3.000	3.002	2.996	2.991	2.993	3.005	2.979	3.000	2.988	2.999	2.987	3.001	2.999	2.995	2.988	2.997	2.992	2.991
MP5(μSv/h)	2.952	2.958	2.936	2.969	2.951	2.949	2.935	2.935	2.945	2.950	2.951	2.947	2.947	2.944	2.952	2.944	2.934	2.941	2.948	2.929	2.932	2.934	2.931	2.938
MP6(μSv/h)	2.946	2.936	2.920	2.941	2.934	2.943	2.935	2.931	2.924	2.931	2.935	2.931	2.920	2.942	2.930	2.928	2.929	2.923	2.928	2.929	2.922	2.937	2.935	2.925
MP7(μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	S	S	S	S	SSE	S	S	SSE
wind speed (m/s)	6.6	6.7	7.9	8.8	8.4	8.0	5.8	4.6	3.8	4.6	4.1	4.3	4.4	4.1	3.8	5.6	8.2	10.1	5.5	1.4	3.3	7.3	4.1	3.5

April 8, 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)	3.644	3.652	3.629	3.640	3.645	3.639	3.649	3.621	3.627	3.645	3.653	3.625	3.633	3.651	3.640	3.644	3.630	3.641	3.665	3.635	3.663	3.651	3.633	3.640
MP2(μSv/h)	2.668	2.662	2.673	2.684	2.670	2.679	2.683	2.687	2.685	2.676	2.675	2.694	2.679	2.672	2.643	2.667	2.682	2.676	2.677	2.696	2.682	2.677	2.675	2.671
MP3(μSv/h)	3.920	3.908	3.917	3.937	3.914	3.912	3.917	3.909	3.902	3.906	3.916	3.908	3.909	3.918	3.910	3.909	3.902	3.903	3.909	3.909	3.894	3.910	3.912	3.899
MP4(μSv/h)	2.997	2.985	2.973	2.977	2.997	2.998	2.994	2.987	2.998	2.986	2.994	2.986	2.987	3.004	3.008	2.996	3.019	3.002	2.997	3.013	3.020	3.011	3.038	3.029
MP5(μSv/h)	2.936	2.925	2.932	2.939	2.929	2.934	2.925	2.930	2.950	2.920	2.940	2.940	2.929	2.935	2.920	2.958	2.856	2.954	2.929	2.957	2.944	2.943	2.925	2.931
MP6(μSv/h)	2.923	2.935	2.923	2.917	2.922	2.937	2.936	2.934	2.918	2.934	2.846	2.917	2.930	2.928	2.913	2.926	2.916	2.919	2.936	2.925	2.916	2.939	2.928	2.933
MP7(μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	S	S	SSE	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
wind speed (m/s)	7.0	6.6	7.0	7.9	8.5	8.4	8.8	10.6	12.3	10.2	9.0	9.4	9.2	8.2	7.6	6.0	9.5	12.6	12.8	15.2	15.9	15.7	14.6	13.5

Fukushima Dai-ni (TEPCO's Monitaring Post)

April 7, 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(μ Sv/h)	3.821	3.795	3.789	3.775	3.785	3.780	3.793	3.780	3.775	3.788	3.810	3.781	3.794	3.797	3.785	3.776	3.785	3.771	3.785	3.770	3.765	3.763	3.742	3.741
MP2(μ Sv/h)	2.781	2.781	2.783	2.784	2.784	2.782	2.778	2.776	2.779	2.780	2.782	2.778	2.784	2.783	2.780	2.772	2.794	2.771	2.780	2.769	2.766	2.769	2.765	2.760
MP3(μ Sv/h)	4.079	4.085	4.080	4.072	4.091	4.079	4.060	4.057	4.079	4.071	4.063	4.076	4.079	4.079	4.077	4.069	4.068	4.074	4.089	4.063	4.072	4.080	4.050	4.051
MP4(μ Sv/h)	3.106	3.106	3.099	3.094	3.105	3.097	3.096	3.097	3.112	3.105	3.105	3.112	3.120	3.126	3.114	3.111	3.107	3.102	3.094	3.103	3.107	3.098	3.112	3.106
MP5(μ Sv/h)	3.065	3.073	3.056	3.040	3.074	3.056	3.047	3.071	3.068	3.040	3.043	3.047	3.042	3.052	3.047	3.034	3.036	3.014	3.018	3.032	3.022	3.035	3.019	3.031
MP6(μ Sv/h)	3.045	3.062	3.047	3.049	3.036	3.034	3.029	3.064	3.061	3.042	3.044	3.047	3.049	3.066	3.056	3.062	3.050	3.044	3.051	3.056	3.037	3.022	3.035	3.030
MP7(μ Sv/h)	2.210	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	S	S	S	S	S	S	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	SSE
wind speed (m/s)	9.5	10.4	8.4	9.2	9.0	9.4	8.3	8.1	6.6	7.5	7.3	4.1	6.1	6.8	8.2	8.8	8.8	9.3	9.7	10.1	10.3	9.7	9.9	9.3

*1: NM: Not measured due to the malfunction

April 7, 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(μ Sv/h)	3.745	3.740	3.708	3.716	3.724	3.710	3.719	3.722	3.702	3.700	3.712	3.717	3.712	3.722	3.707	3.714	3.722	3.707	3.716	3.719	3.701	3.716	3.720	3.710
MP2(μ Sv/h)	2.754	2.749	2.754	2.732	2.723	2.747	2.736	2.721	2.730	2.730	2.718	2.701	2.710	2.725	2.717	2.715	2.719	2.713	2.725	2.713	2.716	2.730	2.707	2.729
MP3(μ Sv/h)	4.043	4.054	4.025	4.029	4.052	4.019	4.028	4.021	4.018	4.020	4.041	3.991	4.016	4.013	4.008	4.008	4.007	4.018	4.003	4.002	4.009	4.004	4.015	4.018
MP4(μ Sv/h)	3.098	3.089	3.083	3.078	3.057	3.065	3.030	3.040	3.047	3.037	3.042	3.060	3.048	3.039	3.045	3.040	3.047	3.043	3.047	3.041	3.039	3.052	3.044	3.037
MP5(μ Sv/h)	3.034	3.010	3.022	3.017	3.016	2.996	3.008	3.013	3.018	2.985	3.003	2.993	2.988	2.985	2.999	2.998	2.984	2.976	2.987	2.989	2.987	2.991	2.977	2.976
MP6(μ Sv/h)	3.047	3.039	3.042	3.024	3.018	3.011	3.018	3.007	2.993	2.991	3.007	2.963	2.985	2.986	2.950	2.968	2.965	2.969	2.980	2.973	2.962	2.960	2.961	2.970
MP7(μ Sv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	S	S	S	S	SSE	SSE	SSE	S	SSE	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	WSW
wind speed (m/s)	11.0	10.9	11.1	10.3	6.9	8.0	8.5	9.0	8.6	8.9	8.1	8.0	9.0	7.7	5.7	5.4	7.4	6.3	5.6	3.5	3.2	3.8	3.6	4.2

April 7, 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(μ Sv/h)	3.699	3.719	3.707	3.717	3.706	3.718	3.703	3.716	3.715	3.706	3.697	3.704	3.695	3.707	3.701	3.699	3.685	3.702	3.702	3.692	3.693	3.699	3.699	3.684
MP2(μ Sv/h)	2.713	2.714	2.713	2.711	2.702	2.712	2.719	2.716	2.711	2.729	2.706	2.702	2.703	2.710	2.706	2.708	2.700	2.698	2.701	2.692	2.693	2.697	2.688	2.705
MP3(μ Sv/h)	4.005	4.015	3.979	4.007	4.011	4.008	4.007	4.006	3.995	3.990	3.990	3.987	4.004	4.000	3.994	3.975	4.003	3.977	3.975	3.987	3.990	3.987	3.980	3.978
MP4(μ Sv/h)	3.043	3.037	3.043	3.044	3.044	3.037	3.043	3.026	3.047	3.037	3.033	3.041	3.036	3.037	3.041	3.018	3.021	3.016	3.022	3.034	3.040	3.013	3.021	3.028
MP5(μ Sv/h)	2.992	2.979	2.985	2.987	2.989	3.008	2.991	2.994	2.983	2.995	2.972	2.990	2.976	2.978	2.982	2.975	2.976	2.975	2.977	2.982	2.963	2.978	2.980	2.962
MP6(μ Sv/h)	2.964	2.954	2.964	2.966	2.972	2.967	2.972	2.973	2.969	2.966	2.949	2.974	2.955	2.959	2.971	2.951	2.958	2.955	2.962	2.954	2.959	2.965	2.959	2.962
MP7(μ Sv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	WSW	W	W	W	WSW	WSW	SW	SSW	SSW	SW	SW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
wind speed (m/s)	5.8	6.5	6.6	5.1	3.5	3.7	2.7	2.3	4.4	3.5	3.5	2.3	3.1	4.1	3.5	3.3	4.9	5.3	5.4	7.5	7.6	6.9	8.5	9.2

2011/4/9 13:40

Fukushima Dai-ni (TEPCO's Monitaring Post)

April 7, 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)	3.852	3.862	3.863	3.850	3.863	3.845	3.851	3.389	3.855	3.849	3.837	3.850	3.840	3.834	3.842	3.836	3.846	3.835	3.841	3.827	3.824	3.843	3.836	3.847
MP2(μSv/h)	2.831	2.815	2.799	2.808	2.802	2.815	2.808	2.807	2.800	2.804	2.799	2.810	2.809	2.821	2.810	2.806	2.798	2.802	2.798	2.793	2.787	2.804	2.804	2.809
MP3(μSv/h)	4.172	4.157	4.160	4.175	4.152	4.155	4.144	4.158	4.146	4.158	4.144	4.168	4.157	4.146	4.149	4.151	4.135	4.137	4.146	4.120	4.125	4.144	4.134	4.128
MP4(μSv/h)	3.171	3.161	3.162	3.144	3.143	3.153	3.155	3.154	3.145	3.153	3.166	3.138	3.146	3.154	3.156	3.160	3.151	3.142	3.142	3.145	3.139	3.133	3.151	3.135
MP5(μSv/h)	3.108	3.110	3.099	3.107	3.096	3.103	3.097	3.104	3.107	3.093	3.093	3.082	3.099	3.092	3.090	3.074	3.083	3.081	3.076	3.089	3.082	3.079	3.095	3.070
MP6(μSv/h)	3.078	3.103	3.085	3.086	3.091	3.086	3.074	3.083	3.102	3.088	3.077	3.085	3.077	3.085	3.078	3.082	3.088	3.069	3.080	3.079	3.073	3.069	3.067	3.072
MP7(μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SSW	SSW	SSW	SW	SW	SSW	SW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW
wind speed (m/s)	6.0	5.5	6.3	6.8	6.9	6.0	7.1	6.5	6.0	5.2	4.1	4.8	4.8	3.4	2.5	0.4	1.9	4.0	4.4	5.0	3.3	3.3	1.8	2.0

*1: NM: Not measured due to the malfunction

April 7, 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)	3.843	3.843	3.845	3.828	3.842	3.827	3.834	3.831	3.821	3.824	3.825	3.822	3.819	3.812	3.818	3.811	3.813	3.801	3.824	3.824	3.814	3.805	3.821	3.819
MP2(μSv/h)	2.822	2.807	2.809	2.798	2.795	2.812	2.799	2.793	2.796	2.795	2.789	2.779	2.776	2.789	2.803	2.790	2.791	2.787	2.791	2.777	2.775	2.793	2.787	2.782
MP3(μSv/h)	4.134	4.146	4.137	4.122	4.131	4.136	4.120	4.125	4.115	4.135	4.122	4.112	4.119	4.110	4.117	4.120	4.122	4.106	4.104	4.112	4.107	4.114	4.103	4.112
MP4(μSv/h)	3.140	3.154	3.124	3.139	3.123	3.131	3.132	3.138	3.136	3.126	3.126	3.120	3.126	3.119	3.130	3.132	3.121	3.132	3.118	3.122	3.128	3.136	3.117	3.136
MP5(μSv/h)	3.091	3.076	3.086	3.079	3.076	3.065	3.083	3.070	3.067	3.065	3.065	3.068	3.073	3.071	3.054	3.064	3.066	3.077	3.066	3.060	3.075	3.071	3.074	3.061
MP6(μSv/h)	3.089	3.082	3.070	3.083	3.081	3.078	3.075	3.090	3.063	3.062	3.069	3.072	3.069	3.065	3.070	3.068	3.065	3.068	3.068	3.700	3.068	3.063	3.067	3.053
MP7(μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	SSW	S	SSW	SSW	SSW	S	SSW	SSW	S	S	S	SSW	SSW	S	S	SSW	SSW	SSW	S	S	SSW	SSW	SSW	S
wind speed (m/s)	3.0	2.5	2.7	3.5	4.1	4.7	5.3	3.8	3.3	3.7	2.5	3.0	3.3	2.3	2.7	4.1	3.1	2.4	2.8	2.2	3.9	3.2	3.7	1.4

April 7, 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)	3.811	3.810	3.810	3.830	3.811	3.812	3.798	3.792	3.818	3.811	3.799	3.811	3.795	3.804	3.796	3.800	3.809	3.808	3.812	3.795	3.807	3.809	3.787	3.788
MP2(μSv/h)	2.792	2.781	2.784	2.810	2.795	2.807	2.793	2.775	2.797	2.784	2.787	2.789	2.792	2.792	2.780	2.780	2.794	2.779	2.788	2.774	2.791	2.797	2.795	2.791
MP3(μSv/h)	4.115	4.112	4.110	4.122	4.110	4.106	4.110	4.102	4.117	4.114	4.102	4.098	4.115	4.099	4.099	4.085	4.089	4.089	4.103	4.088	4.089	4.092	4.089	4.082
MP4(μSv/h)	3.113	3.127	3.139	3.125	3.118	3.122	3.125	3.112	3.120	3.128	3.127	3.134	3.120	3.125	3.140	3.109	3.117	3.114	3.097	3.120	3.119	3.118	3.126	3.114
MP5(μSv/h)	3.060	3.056	3.062	3.066	3.045	3.067	3.060	3.058	3.071	3.071	3.043	3.058	3.067	3.053	3.071	3.051	3.078	3.066	3.069	3.069	3.062	3.069	3.065	3.071
MP6(μSv/h)	3.070	3.062	3.055	3.057	3.064	3.052	3.075	3.057	3.066	3.048	3.052	3.069	3.067	3.054	3.055	3.071	3.067	3.048	3.050	3.051	3.052	3.068	3.053	3.065
MP7(μSv/h)	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1	NM *1
wind direction	S	SSE	S	SSW	SSW	SSW	S	SSW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
wind speed (m/s)	1.6	1.1	3.9	4.7	4.5	4.2	4.4	5.0	3.3	4.3	6.5	6.3	5.7	6.2	6.6	6.7	8.3	7.1	8.5	9.0	8.9	8.9	9.3	10.1

Fukushima Dai-ni NPS

as of 17:00, April 8th, 2011

MP1 : 3.590 μSv/h (as of 15:00 April 8th)
(Ref. Value:0.035～0.054 μSv/h)

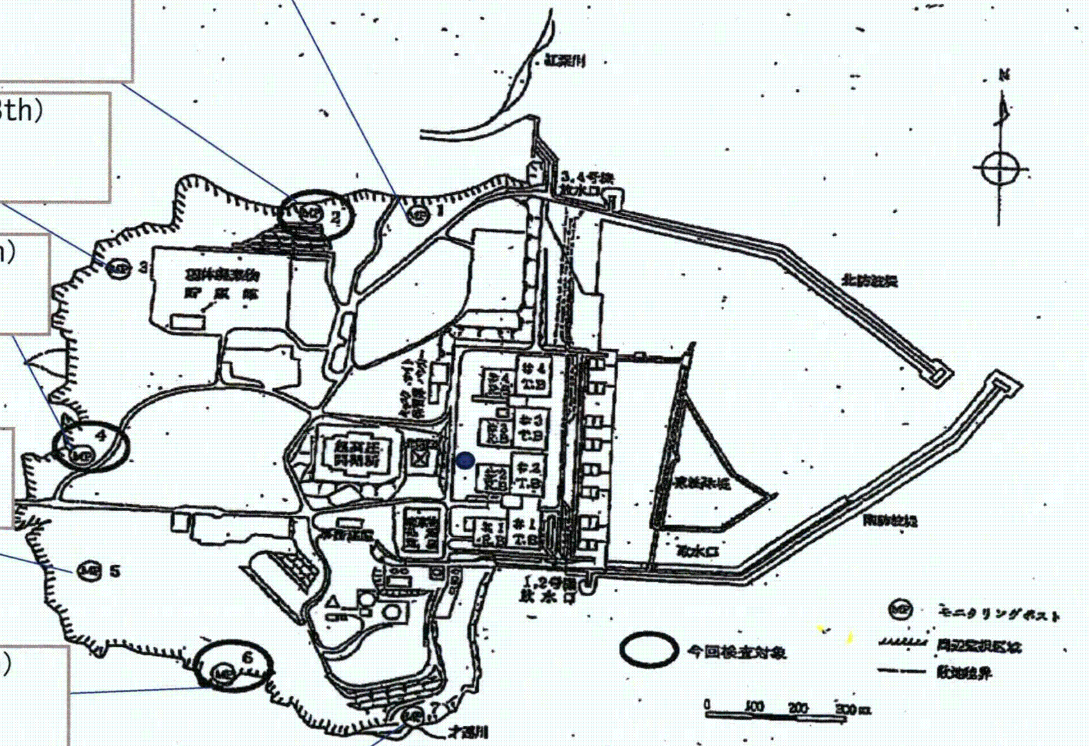
Location of Monitoring Post

MP2 : 2.658 μSv/h (as of 15:00 April 8th)
(Ref. Value:0.042～0.062 μSv/h)

MP3 : 3.856 μSv/h (as of 15:00 April 8th)
(Ref. Valur:0.036～0.052 μSv/h)

MP4 : 2.968 μSv/h (as of 15:00 April 8th)
(Ref. value: 0.036～0.052 μSv/h)

MP5 : 2.904 μSv/h (as of 15:00 April 8th)
(Ref. Value:0.041～0.058 μSv/h)



MP6 : 2.882 μSv/h (as of 15:00 April 8th)
(Ref. value:0.044～0.063 μSv/h)

MP7 : 2.070 μSv/h (as of 12:00 April 8th)
(Ref. Value: 0.043～0.062 μSv/h)

添付資料(2)

Results of environmental monitoring at each NPSs etc. (as of 9am April 8th, 2011)

unit: μ Sv/h

Range of normal average value	Company	NPS	April 7, 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	0.029	0.028	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.031
0.024～0.060	Tohoku Electric Power Co.	Onagawa NPS	0.38	0.38	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
0.012～0.060		Higashidori NPS	0.017	0.018	0.018	0.017	0.018	0.018	0.017	0.017	0.017	0.017	0.018	0.017
0.033～0.050	Tokyo Electric Power Co.	Fukushima Dai-ichi※	58.0	57.7	57.6	57.4	57.1	56.8	56.8	56.6	56.7	56.5	56.5	56.3
0.036～0.052		Fukushima Dai-ni	4.079	4.060	4.079	4.089	4.043	4.028	4.016	4.003	4.005	4.007	4.004	3.975
0.011～0.159		Kashiwazaki kariwa NPS	0.066	0.066	0.066	0.065	0.066	0.066	0.066	0.065	0.067	0.067	0.067	0.066
0.036～0.053	Japan Atomic Power Co.	Tokai Dai-ni NPS	0.457	0.456	0.459	0.456	0.454	0.454	0.455	0.454	0.448	0.450	0.447	0.446
0.039～0.110		Tsuruga NPS	NM *1	NM *1	NM *1	NM *1	NM *1	0.075	0.075	0.076	0.075	0.076	0.075	0.076
0.064～0.108	Chubu Electric Power Co.	Hamaoka NPS	0.046	0.045	0.045	0.045	0.045	0.045	0.044	0.045	0.045	0.045	0.044	0.045
0.0207～0.132	Hokuriku Electric Power Co.	Shika NPS	0.033	0.033	0.033	0.033	0.033	0.033	0.034	0.034	0.034	0.034	0.034	0.034
0.028～0.130	Chugoku Electric Power Co.	Shimane NPS	0.029	0.029	0.030	0.031	0.031	0.030	0.030	0.029	0.030	0.030	0.030	0.030
0.070～0.077	Kansai Electric Power Co.	Mihama NPS	0.074	0.075	0.075	0.073	0.075	0.072	0.074	0.074	0.074	0.073	0.074	0.075
0.045～0.047		Takahama NPS	0.043	0.043	0.043	0.042	0.042	0.042	0.043	0.043	0.043	0.043	0.043	0.043
0.036～0.040		Ooi NPS	0.034	0.034	0.034	0.034	0.034	0.033	0.034	0.034	0.034	0.034	0.035	0.034
0.011～0.080	Shikoku Electeic Power Co.	Ikata NPS	0.013	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
0.023～0.087	Kyushu Electric Power Co.	Genkai NPS	0.026	0.027	0.026	0.026	0.027	0.026	0.026	0.025	0.026	0.026	0.027	0.032
0.034～0.120		Sendai NPS	0.037	0.036	0.038	0.038	0.037	0.038	0.038	0.037	0.039	0.035	0.036	0.037
0.009～0.069	Japan Nuclear Fuel Limited	Japan Nuclear Fuel Reprocessing Plant	0.016	0.016	0.016	0.016	0.017	0.017	0.016	0.016	0.016	0.016	0.016	0.016
0.009～0.071		Japan Nuclear Fuel Plant Disposal	0.023	0.023	0.022	0.023	0.022	0.023	0.023	0.023	0.022	0.023	0.023	0.023

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

Range of normal average value	Company	NPS	April 8, 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	0.030	0.030	0.029	0.029	0.029	0.032	0.033	0.034	0.036	0.038		
0.024～0.060	Tohoku Electric Power Co.	Onagawa NPS	0.37	0.37	0.37	0.37	0.38	0.38	0.38	0.38	0.38	0.38		
0.012～0.060		Higashidori NPS	NM *2	NM *2	NM *2	NM *2	NM *2	0.018	0.020	0.020	0.021	0.021		
0.033～0.050	Tokyo Electric Power Co.	Fukushima Dai-ichi※	56.0	56.0	55.5	55.4	55.2	55.2	55.1	55.0	54.8	54.8		
0.036～0.052		Fukushima Dai-ni	3.966	3.959	3.958	3.961	3.946	3.950	3.934	3.914	3.920	3.917		
0.011～0.159		Kashiwazaki kariwa NPS	0.065	0.066	0.066	0.066	0.067	0.066	0.067	0.066	0.066	0.067		
0.036～0.053	Japan Atomic Power Co.	Tokai Dai-ni NPS	0.447	0.444	0.442	0.442	0.443	0.441	0.444	0.443	0.443	0.442		
0.039～0.110		Tsuruga NPS	0.075	0.078	0.075	0.076	0.077	0.076	0.076	0.076	0.076	0.080		
0.064～0.108	Chubu Electric Power Co.	Hamaoka NPS	0.044	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.044	0.044		
0.0207～0.132	Hokuriku Electric Power Co.	Shika NPS	0.034	0.033	0.034	0.034	0.034	0.034	0.034	0.033	0.033	0.036		
0.028～0.130	Chugoku Electric Power Co.	Shimane NPS	0.031	0.031	0.030	0.030	0.033	0.033	0.032	0.032	0.033	0.034		
0.070～0.077	Kansai Electric Power Co.	Mihama NPS	0.073	0.073	0.075	0.074	0.073	0.074	0.074	0.074	0.073	0.076		
0.045～0.047		Takahama NPS	0.043	0.043	0.042	0.042	0.043	0.042	0.043	0.042	0.043	0.046		
0.036～0.040		Ooi NPS	0.034	0.035	0.035	0.034	0.034	0.035	0.035	0.035	0.034	0.036		
0.011～0.080	Shikoku Electeic Power Co.	Ikata NPS	0.013	0.013	0.013	0.013	0.013	0.014	0.013	0.017	0.018	0.016		
0.023～0.087	Kyushu Electric Power Co.	Genkai NPS	0.032	0.027	0.031	0.030	0.029	0.028	0.030	0.033	0.035	0.032		
0.034～0.120		Sendai NPS	0.037	0.041	0.038	0.037	0.035	0.038	0.040	0.038	0.047	0.049		
0.009～0.069	Japan Nuclear Fuel Limited	Japan Nuclear Fuel Reprocessing Plant	0.016	0.016	0.016	0.017	0.017	0.017	0.017	0.016	0.017	0.017		
0.009～0.071		Japan Nuclear Fuel Plant Disposal	0.023	NM *2	NM *2	NM *2	NM *2	NM *2	NM *2	NM *2	NM *2	NM *2		

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

*1: NM: Not measured because of inspection
*2: NM: Not measured because of earthquake

From:	OST02 HOC
Sent:	Saturday, April 09, 2011 10:06 PM
To:	PMT01 Hoc; PMT02 Hoc; PMT11 Hoc; Hoc, PMT12; FOIA Response.hoc Resource
Subject:	FW: update

From: Weber, Michael
Sent: Saturday, April 09, 2011 9:46 PM
To: OST02 HOC; ET01 Hoc; ET05 Hoc
Subject: FYI - update

From: Zimmerman, Roy
To: Jaczko, Gregory
Cc: Virgilio, Martin; Uhle, Jennifer; Correia, Richard; Blount, Tom; Hiland, Patrick; Weber, Michael; Evans, Michele; Correia, Richard; Brenner, Eliot
Sent: Sat Apr 09 18:31:29 2011
Subject: update

Chairman, based on rapid, negative feedback from several federal partners we are going to continue to issue our SITREP reports. Our intention is to cut back to issuing it once a day vice twice, likely around 1800 as we do now as it is more efficient for us.

Also, a couple RST staff have completed an evaluation of a possible breach of the reactor vessel and ensuing ex-vessel occurrence of fuel at Unit 2 early in the event –mid March. Their conclusion is that it did occur and we are sharing with the site team and other appropriate stakeholders (GE, DOE, INPO) for their review and possible severe accident strategy changes for that unit, i.e. possibly further importance to flooding up the containment to the bottom of the reactor vessel.

JJJ/287

From: ET02 Hoc
Sent: Saturday, April 09, 2011 9:46 PM
To: ET07 Hoc
Subject: FW: update

From: ET01 Hoc
Sent: Saturday, April 09, 2011 9:45:45 PM
To: ET02 Hoc
Subject: FW: update
Auto forwarded by a Rule

From: Weber, Michael
Sent: Saturday, April 09, 2011 9:45:45 PM
To: OST02 HOC; ET01 Hoc; ET05 Hoc
Subject: FYI - update
Auto forwarded by a Rule

From: Zimmerman, Roy
To: Jaczko, Gregory
Cc: Virgilio, Martin; Uhle, Jennifer; Correia, Richard; Blount, Tom; Hiland, Patrick; Weber, Michael; Evans, Michele; Correia, Richard; Brenner, Eliot
Sent: Sat Apr 09 18:31:29 2011
Subject: update

Chairman, based on rapid, negative feedback from several federal partners we are going to continue to issue our SITREP reports. Our intention is to cut back to issuing it once a day vice twice, likely around 1800 as we do now as it is more efficient for us.

Also, a couple RST staff have completed an evaluation of a possible breach of the reactor vessel and ensuing ex-vessel occurrence of fuel at Unit 2 early in the event –mid March. Their conclusion is that it did occur and we are sharing with the site team and other appropriate stakeholders (GE, DOE, INPO) for their review and possible severe accident strategy changes for that unit, i.e. possibly further importance to flooding up the containment to the bottom of the reactor vessel.

JJJ | 288

Trapp, James

From:	LIA07 Hoc
Sent:	Saturday, April 09, 2011 6:19 PM
To:	LIA07 Hoc
Subject:	USNRC Earthquake/Tsunami Status Update: 1800 EDT, April 9, 2011
Attachments:	USNRC Earthquake-Tsunami Update.040911.1800EDT.pdf

Attached, please find a 1800 EDT, April 9, 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.

Yen

Yen Chen
Executive Briefing Team Coordinator
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)

JJJ | 289

From: GIS Hoc
Sent: Saturday, April 09, 2011 7:50 PM
To: Cool, Donald
Subject: DOE AMS Data

http://energy.gov/japan2011

JJJ/290

From: OST01 HOC
Sent: Sunday, April 10, 2011 3:58 AM
To: PMT02 Hoc; PMT11 Hoc; Hoc, PMT12
Subject: FW: Fax from +61386166600
Attachments: File1.PDF

-----Original Message-----
From: HOO Hoc
Sent: Sunday, April 10, 2011 3:56 AM
To: Hoc, PMT12; LIA07 Hoc; OST01 HOC; OST02 HOC; OST03 HOC
Subject: FW: Fax from +61386166600

For your use.

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: 301-816-5100
Fax: 301-816-5151
email: hoo.hoc@nrc.gov
secure e-mail: hoo@nrc.sgov.gov

-----Original Message-----
From: hoo1 [mailto:hoo1.hoc@nrc.gov]
Sent: Sunday, April 10, 2011 3:15 AM
To: HOO Hoc
Subject: Fax from +61386166600

RECEIVE NOTIFICATION FOR JOB 00018123

Notice for: HOO1

Remote ID: +61386166600

Received at: 04/10/2011 03:13

Pages: 6

Routed by:

Routed at: 04/10/2011 03:13

JJJ|291

Bureau of Meteorology
National Meteorological and Oceanographic Centre
Melbourne Australia
RSMC for Environmental Emergency Response

FAX:	61 3 9662 1222 or 61 3 9662 1223	
Telephone (24 hours)	Shift Supervisor	61 3 9669 4035
	Email:	rto@bom.gov.au

EMERGENCY EMERGENCY

RSMC Melbourne EER Products

Issued at : 0649 UTC 10:Apr:2011

The following charts will follow:
- trajectory map
- several time-integrated concentration map
- total (dry + wet) deposition map

Please contact us if any problems arise with these products.

Source term and dispersion model details

Location name: Fukushima daiichi Japan

Release Location(decimal degrees): 37.4206 N 141.0329 E

Release Time/Date: 0000 UTC 10 APR 2011

Emissision duration: 24

Emission (per hour): 4.17E-02

Substance released: I131 (Halflife: 8.04398E+0

Vertical distribution: UNIFORM

Meteorological Model: Access G (~80km/29 sigma lvls)

Dispersion Model: HYSPLIT 4.9

Number of Pages (incl cover sheet) = 6

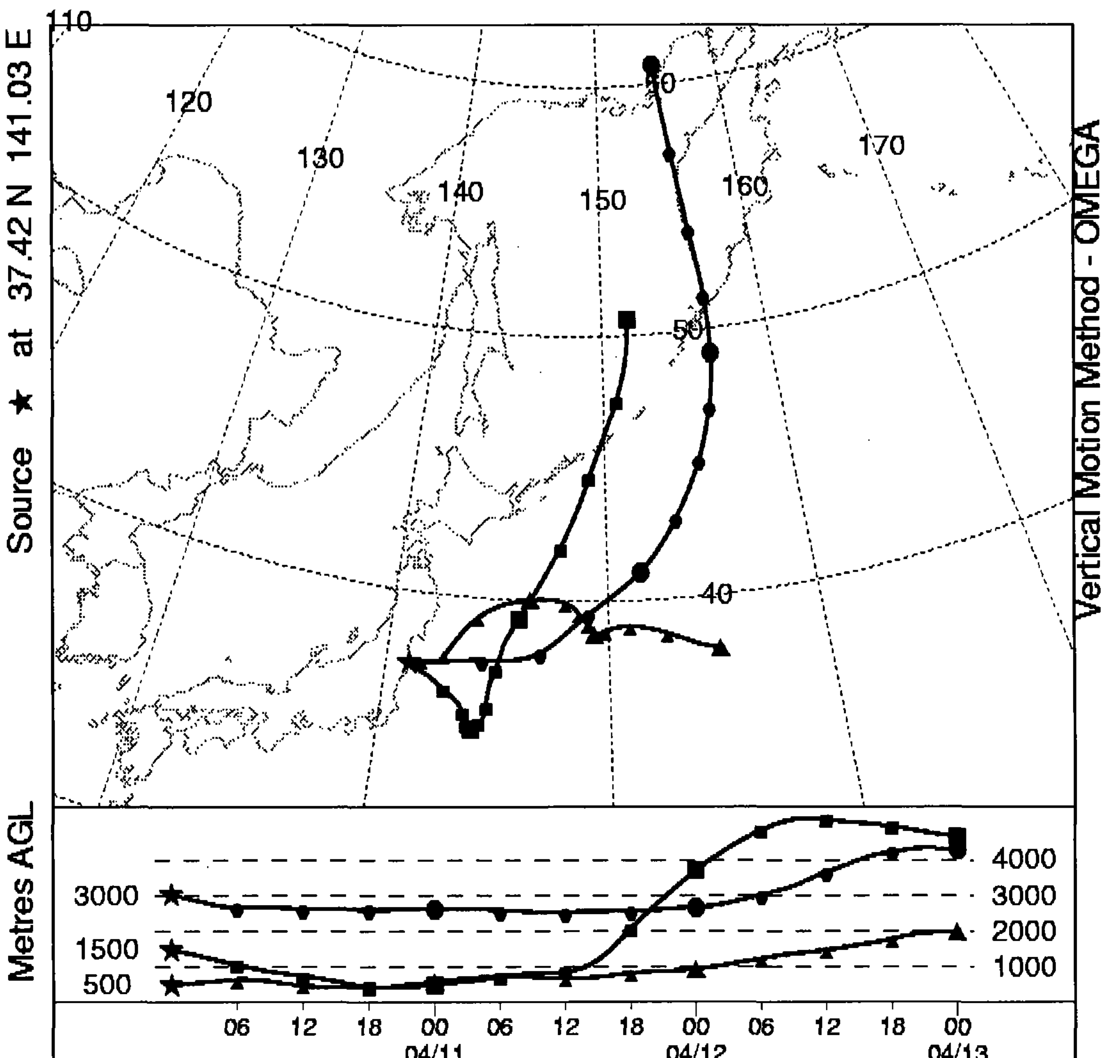
RSMC Melbourne : Environmental Emergency Response Centre

Forward trajectories starting at 0000 UTC 10 Apr 2011

Meteorological Data : ACCESS-G : base time 0000 UTC 10 Apr

OPERATIONAL EVENT

OPERATIONAL EVENT



Transport Model : HYSPLIT 4.9 Issued :Sun Apr 10 06:45:51 2011

Source:Fukushima daiichi : Japan (Lat: 37.4206 N Lon: 141.0329 E)

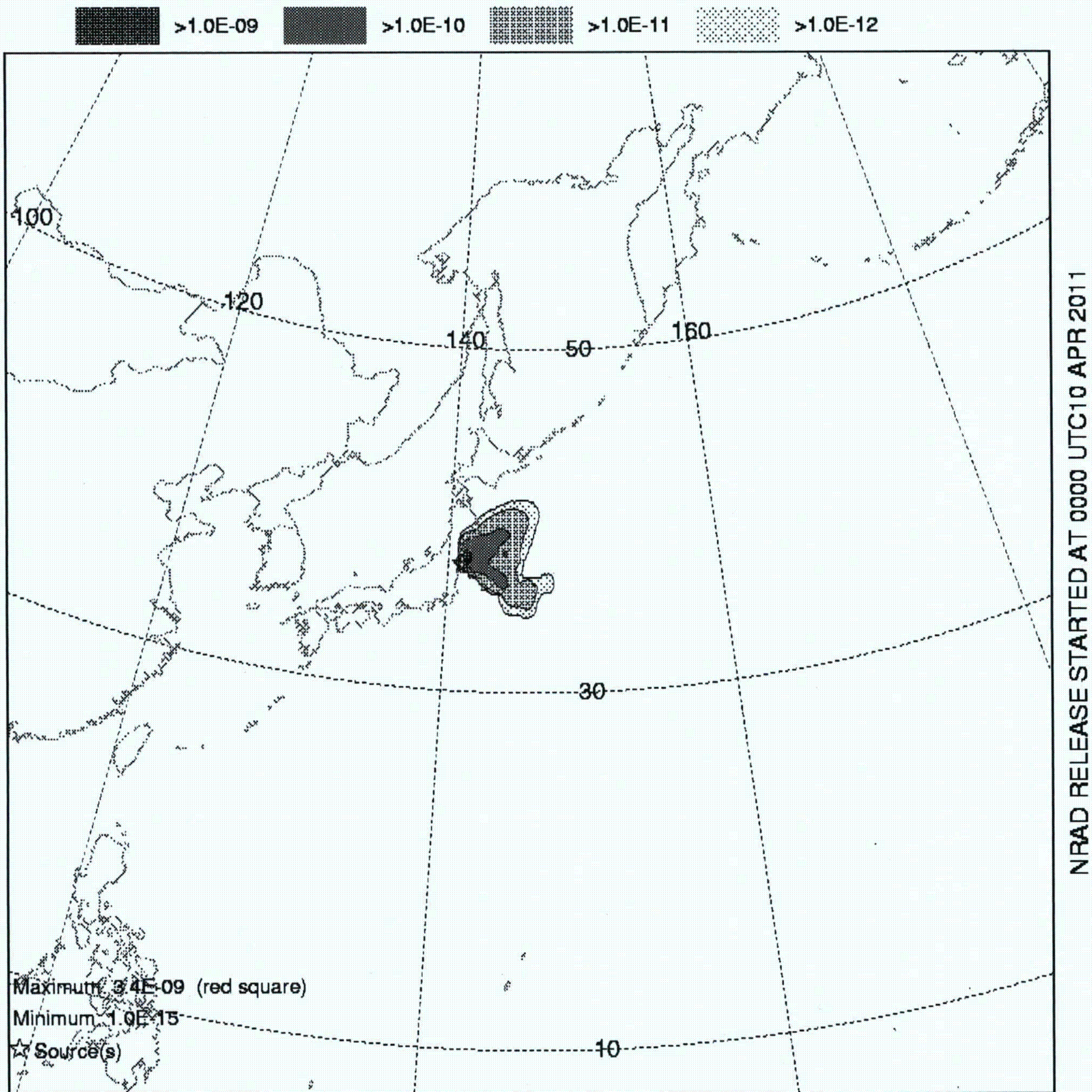
Starting Heights : (1) 500.0m (2) 1500.0m (3) 3000.0m

RSMC Melbourne : Environmental Emergency Response Centre

OPERATIONAL EVENT

Integrated from 0000 10 Apr to 0000 11 Apr 11 (UTC)

Exposure (Bq-s/m3) averaged between 0 m and 500 m



Source:Fukushima daiichi : Japan (Lat: 37.4206 N Lon: 141.0329 E)

Isotope : I131 (Halflife: 8.04398E+00 days) Rate:4.17E-02 Bq/hr

Duration:24 hrs Particles: 500

DryDep Rate 0.001 WetRem (in/below-cloud) 3.20E+05 5.0E-05

Distribution: UNIFORM between 20.0m and 500.0m

Meteorological Data : ACCESS-G : base time 0000 UTC 10 Apr

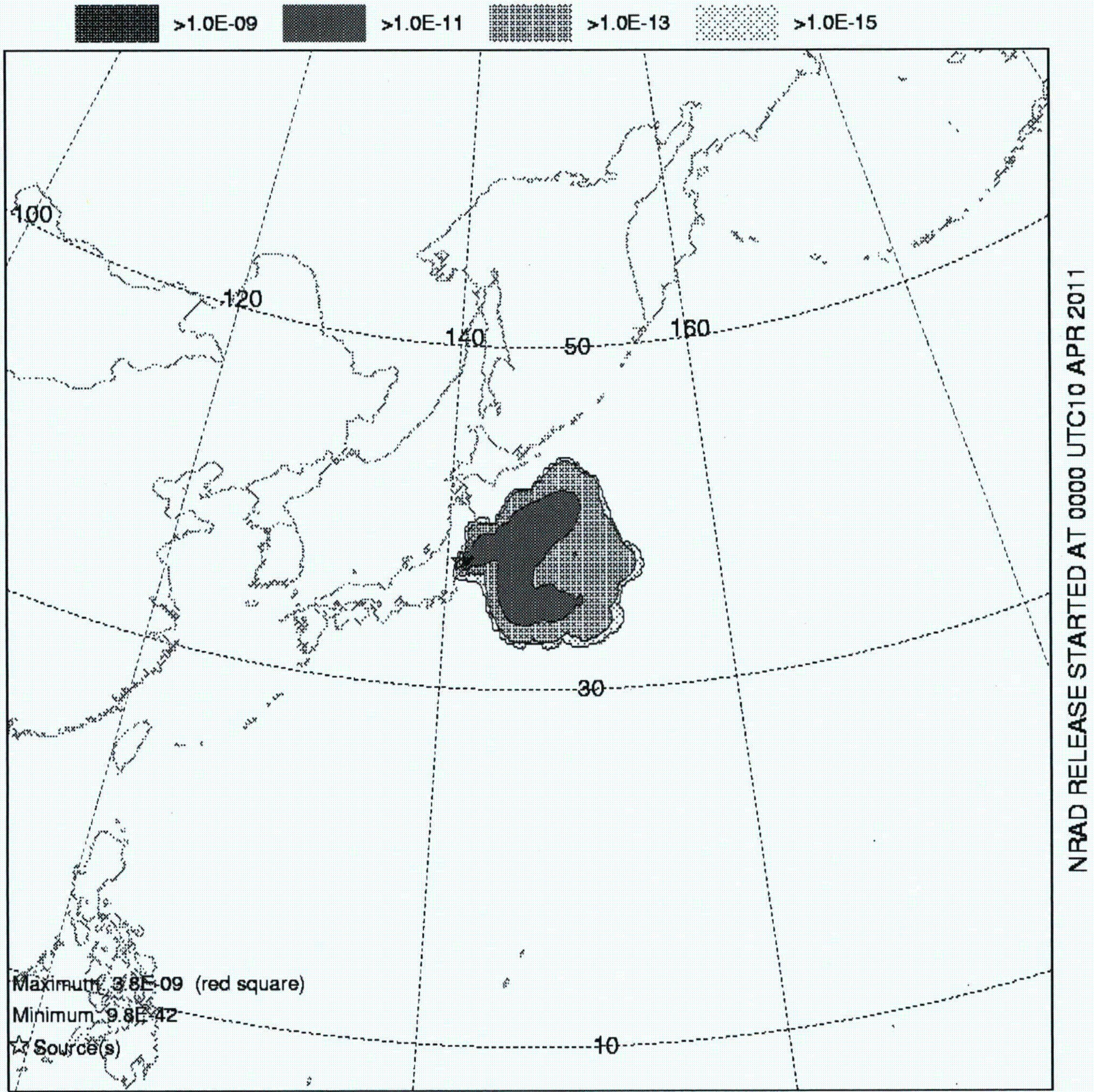
Note: "Contours may change from Chart to Chart" Issued :Sun Apr 10 06:45:51 2011

RSMC Melbourne : Environmental Emergency Response Centre

OPERATIONAL EVENT

Integrated from 0000 11 Apr to 0000 12 Apr 11 (UTC)

Exposure (Bq-s/m3) averaged between 0 m and 500 m



Source:Fukushima daiichi : Japan (Lat: 37.4206 N Lon: 141.0329 E)

Isotope : I131 (Halflife: 8.04398E+00 days) Rate:4.17E-02 Bq/hr

Duration:24 hrs Particles: 500

DryDep Rate 0.001 WetRem (in/below-cloud) 3.20E+05 5.0E-05

Distribution: UNIFORM between 20.0m and 500.0m

Meteorological Data : ACCESS-G : base time 0000 UTC 10 Apr

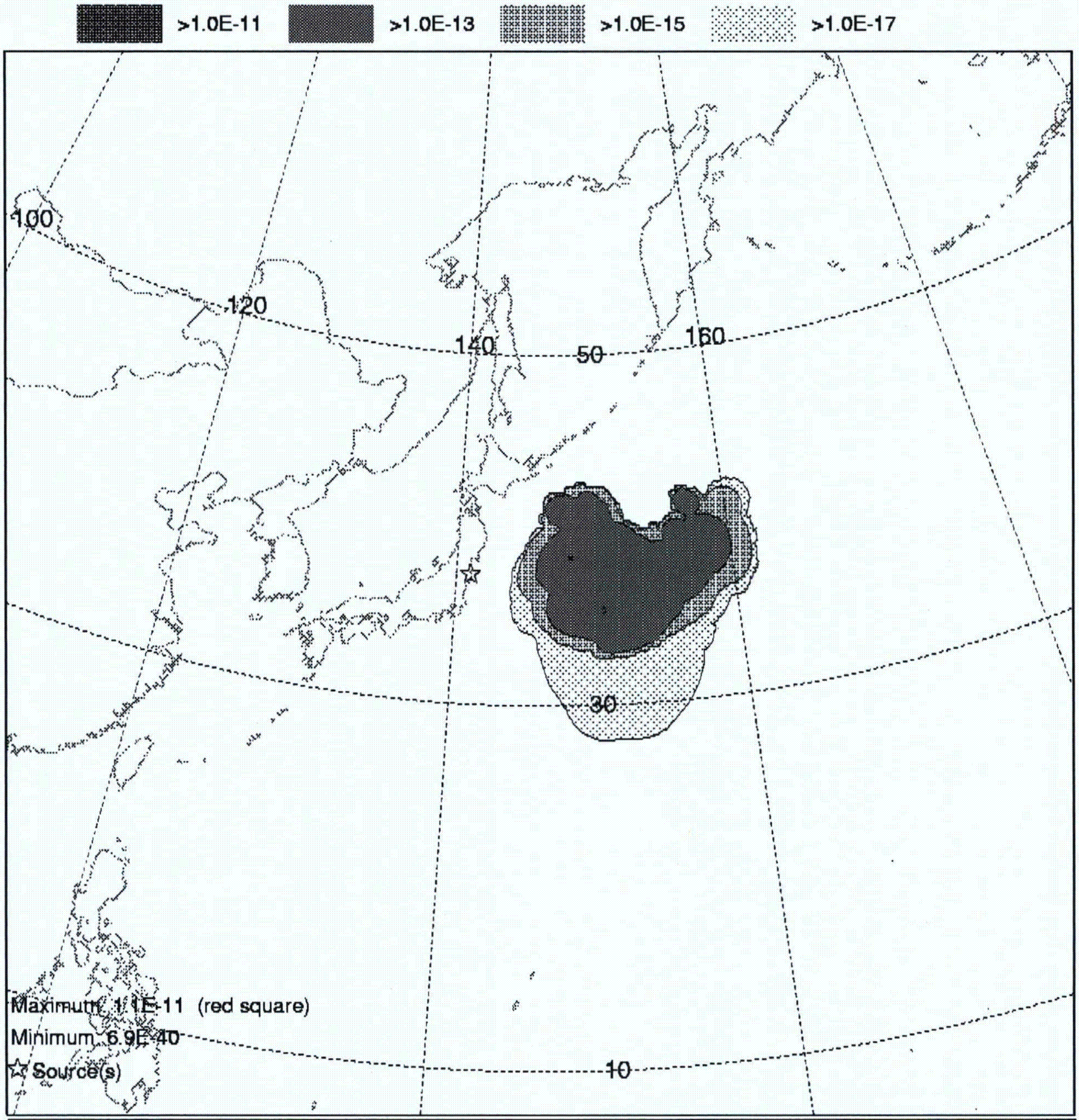
Note: "Contours may change from Chart to Chart" Issued :Sun Apr 10 06:45:51 2011

RSMC Melbourne : Environmental Emergency Response Centre

OPERATIONAL EVENT

Integrated from 0000 12 Apr to 0000 13 Apr 11 (UTC)

Exposure (Bq-s/m3) averaged between 0 m and 500 m



NRAD RELEASE STARTED AT 0000 UTC10 APR 2011

Source:Fukushima daiichi : Japan (Lat: 37.4206 N Lon: 141.0329 E)

Isotope : I131 (Halflife: 8.04398E+00 days) Rate:4.17E-02 Bq/hr

Duration:24 hrs Particles: 500

DryDep Rate 0.001 WetRem (in/below-cloud) 3.20E+05 5.0E-05

Distribution: UNIFORM between 20.0m and 500.0m

Meteorological Data : ACCESS-G : base time 0000 UTC 10 Apr

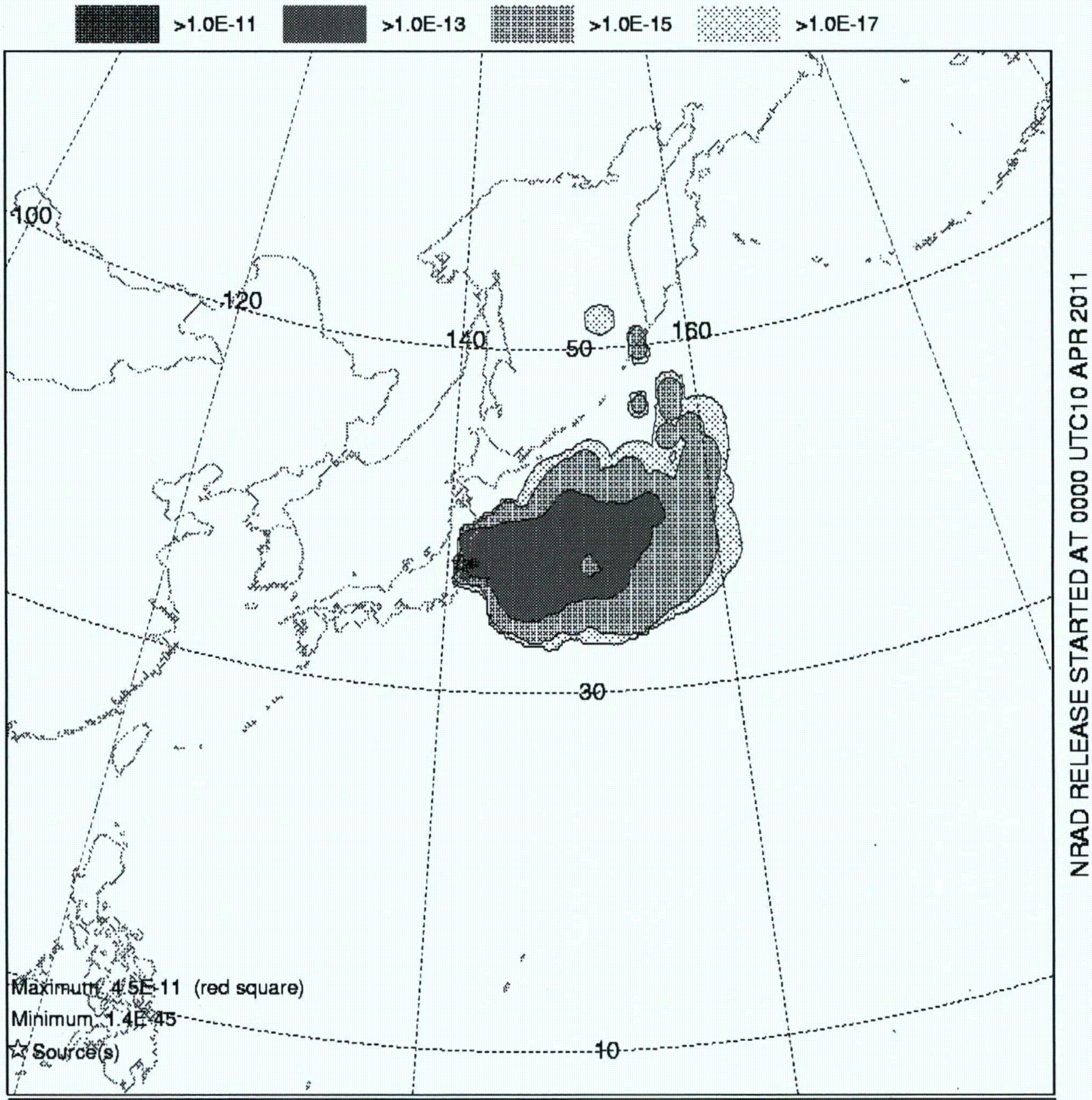
Note: "Contours may change from Chart to Chart" Issued :Sun Apr 10 06:45:51 2011

RSMC Melbourne : Environmental Emergency Response Centre

OPERATIONAL EVENT

Integrated from 0000 10 Apr to 0000 13 Apr 11 (UTC)

Deposition (Bq/m2) at ground-level



Source:Fukushima daiichi : Japan (Lat: 37.4206 N Lon: 141.0329 E)

Isotope : I131 (Halflife: 8.04398E+00 days) Rate:4.17E-02 Bq/hr

Duration:24 hrs Particles: 500

DryDep Rate 0.001 WetRem (in/below-cloud) 3.20E+05 5.0E-05

Distribution: UNIFORM between 20.0m and 500.0m

Meteorological Data : ACCESS-G : base time 0000 UTC 10 Apr

Note: "Contours may change from Chart to Chart" Issued :Sun Apr 10 06:45:51 2011

Trapp, James

From: LIA07 Hoc
Sent: Sunday, April 10, 2011 6:00 PM
To: LIA07 Hoc
Subject: 1800 EDT (April 10, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: USNRC Earthquake-Tsunami Update 041011 1800EDT.pdf

Attached, please find a 1800 EDT, April 10, 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 NRC's Headquarters Operations Officer at 301-816-5100 with questions.

Thanks,
Jeremy

Jeremy Susco
Executive Briefing Team Coordinator
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)
jeremy.susco@nrc.gov

JJJ|292

Trapp, James

From:	LIA07 Hoc
Sent:	Sunday, April 10, 2011 4:39 AM
To:	LIA07 Hoc
Subject:	0430 EDT (April 10, 2011) USNRC Earthquake/Tsunami Status Update
Attachments:	NRC Status Update 04.10.11--0430.pdf

Attached, please find a 0430 EDT, April 10, 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
Executive Briefing Team Coordinator
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)
james.anderson@nrc.gov

JJJ | 293

From: LIA06 Hoc
Sent: Monday, April 11, 2011 4:50 AM
To: LIA08 Hoc
Subject: FW: CONSORTIUM CALL AT 2000 EDT TODAY

Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From: LIA08 Hoc
Sent: Monday, April 11, 2011 4:50 AM
To: Wittick, Brian; LIA02 Hoc; ET02 Hoc
Cc: Emche, Danielle; LIA06 Hoc
Subject: RE: CONSORTIUM CALL AT 2000 EDT TODAY

Thanks Brian and Danielle. As soon as you can get us any info about the condition of nuclear plants in NE Japan after the aftershock of 7.1 a few minutes ago, please let us know. The White House will be calling soon for info. Jeff Temple

---

From: Wittick, Brian
Sent: Monday, April 11, 2011 3:52 AM
To: LIA02 Hoc; ET02 Hoc
Cc: Emche, Danielle; LIA06 Hoc; LIA08 Hoc
Subject: RE: CONSORTIUM CALL AT 2000 EDT TODAY

Request the "liaison japan" group address be updated with the current list of people in Japan. Also, request that the "pre-travel checklist" for new people coming to Japan be updated to identify that people should check in with OIS to ensure they have the correct type of international blackberry. I have an international blackberry and assumed it would work everywhere since it previously had and the carrier said it should, but turns out only specific international blackberries do and OIS knows which ones.

Thanks,
Brian

From: Stahl, Eric
Sent: Sunday, April 10, 2011 5:58 PM
To: LIA02 Hoc; Liaison Japan
Cc: Emche, Danielle; Wittick, Brian
Subject: RE: CONSORTIUM CALL AT 2000 EDT TODAY

It is our understanding that the call the is still occurring and that NRC HQ will continue to take the lead (at least for today). Last I heard was that Embassy or DOE will transition to the lead at some point in the near future.

Thanks,
Eric

JJJ | 294

From: LIA02 Hoc
Sent: Monday, April 11, 2011 6:56 AM
To: Liaison Japan
Cc: Emche, Danielle; Stahl, Eric
Subject: CONSORTIUM CALL AT 2000 EDT TODAY
Importance: High

All,

Please confirm the Consortium call is still on for today at 2000 EDT.

Assuming it is on, please advise as to who will be heading up today's Consortium call.

Thanks,

LIA02

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 6:30 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: CONSORTIUM CALL AT 2000 EDT TODAY

From: Emche, Danielle
Sent: Sunday, April 10, 2011 6:30 PM
To: Stahl, Eric; LIA02 Hoc
Cc: Blamey, Alan; Wittick, Brian
Subject: Re: CONSORTIUM CALL AT 2000 EDT TODAY

As to who within our group has the lead for the call today, it is Alan, but we typically call as a group with DOE and the embassy, with the hope they will be in the overall lead soon.
Danielle
Sent from an NRC BlackBerry.

From: Stahl, Eric
To: LIA02 Hoc
Cc: Blamey, Alan; Emche, Danielle; Wittick, Brian
Sent: Sun Apr 10 18:05:51 2011
Subject: RE: CONSORTIUM CALL AT 2000 EDT TODAY

I'll verify with Alan when I get into the Embassy (in ~30 minutes). That wasn't what I heard during the last call (Friday 2000 call), but if Alan communicated with LT yesterday (or overnight) and decided on a different arrangement, then I could be mistaken.

I'm CCing Alan, Danielle and Brian – any of you please chime in if you've heard differently.

Thanks,
Eric

From: LIA02 Hoc
Sent: Monday, April 11, 2011 7:02 AM
To: Stahl, Eric
Subject: RE: CONSORTIUM CALL AT 2000 EDT TODAY

Eric –

Who did you hear this from? Because was the understanding of the LT Coordinator and LT Director who were on daytime Sunday – and communicated to the current night time shift – that your group had the lead. We were just inquiring as to who within your group (Alan Blamey?) would be heading up the call. Can you please check with Alan re this?

Thanks,

LIA02

JJJ|295

From: Stahl, Eric
Sent: Sunday, April 10, 2011 5:58 PM
To: LIA02 Hoc; Liaison Japan
Cc: Emche, Danielle; Wittick, Brian
Subject: RE: CONSORTIUM CALL AT 2000 EDT TODAY

It is our understanding that the call the is still occurring and that NRC HQ will continue to take the lead (at least for today). Last I heard was that Embassy or DOE will transition to the lead at some point in the near future.

Thanks,
Eric

From: LIA02 Hoc
Sent: Monday, April 11, 2011 6:56 AM
To: Liaison Japan
Cc: Emche, Danielle; Stahl, Eric
Subject: CONSORTIUM CALL AT 2000 EDT TODAY
Importance: High

All,

Please confirm the Consortium call is still on for today at 2000 EDT.

Assuming it is on, please advise as to who will be heading up today's Consortium call.

Thanks,

LIA02

From: OST01 HOC
Sent: Sunday, April 10, 2011 1:17 PM
To: LIA07 Hoc; LIA02 Hoc; LIA03 Hoc
Attachments: FW: IAEA distributed documents; FW: IAEA distributed documents

JJJ/296

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 1:53 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Test lia03

From: LIA03 Hoc
Sent: Sunday, April 10, 2011 1:53 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: Test lia03

From: LIA01 Hoc
Sent: Sunday, April 10, 2011 1:53 PM
To: LIA03 Hoc
Subject: Test lia03

JJJ | 297

From: LIA03 Hoc
Sent: Sunday, April 10, 2011 1:54 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: test lia10

From: LIA10 Hoc
Sent: Sunday, April 10, 2011 1:54 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: test lia10

From: LIA01 Hoc
Sent: Sunday, April 10, 2011 1:54 PM
To: LIA10 Hoc
Subject: test lia10

JJJ | 298

From: LIA03 Hoc
Sent: Sunday, April 10, 2011 4:13 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: CHAIRMAN CALL AT 1830 EDT

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 4:13 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: CHAIRMAN CALL AT 1830 EDT

From: LIA03 Hoc
Sent: Sunday, April 10, 2011 4:12 PM
To: Casto, Chuck
Cc: LIA02 Hoc
Subject: CHAIRMAN CALL AT 1830 EDT

Chuck –

Please remain on the line at the end of the call scheduled with the Chairman today (Sunday, April 10) at 1830 EDT. The ET and Marty Virgilio would like to have a conversation with you at that time.

Please acknowledge receipt of this message.

Thanks,

LIAO3

JJJ|299

From: LIA10 Hoc
Sent: Sunday, April 10, 2011 1:54 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: Test lia02

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 1:53 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Test lia02

From: LIA01 Hoc
Sent: Sunday, April 10, 2011 1:53 PM
To: LIA02 Hoc
Subject: Test lia02

JJJ | 300

From: LIA03 Hoc
Sent: Sunday, April 10, 2011 9:14 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: Request for Slide Package from Shaw Group

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 9:14 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Request for Slide Package from Shaw Group

From: Emche, Danielle
Sent: Sunday, April 10, 2011 9:14 PM
To: LIA02 Hoc
Cc: Liaison Japan; Stahl, Eric; LIA06 Hoc; Casto, Chuck
Subject: Re: Request for Slide Package from Shaw Group

Fedex tracking number is 8695-5112-8152.

It was delivered 4/8 at HQ and signed for by M. Costillo. Maybe someone needs to check. The Embassy said they can't scan them in because they are an odd paper size and the file will be too big to email. I'm not sure that their answer makes sense but that's what I'm told. Please confirm that Marty has his hands on the slides.

Danielle
Sent from an NRC BlackBerry.

From: LIA02 Hoc
To: Casto, Chuck
Cc: Liaison Japan; Emche, Danielle; Stahl, Eric; LIA06 Hoc
Sent: Sun Apr 10 19:53:51 2011
Subject: Request for Slide Package from Shaw Group

Chuck,

Marty Virgilio and the ET have asked that you forward to us the package of slides presented to the Site Team recently by the Shaw Group. Can you please send?

Thanks,

LIA02

JJJ|301

From: LIA10 Hoc
Sent: Sunday, April 10, 2011 5:29 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: us nrc - fourth team

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 5:29 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: us nrc - fourth team

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 5:29 PM
To: RMTPACTSU_RM@ofda.gov; RMTPACTSU_AC
Cc: Carter, Mary; Evans, Michele; Jackson, Karen; LIA06 Hoc; LIA02 Hoc; Kozal, Jason
Subject: us nrc - fourth team

US AID Response Manager and AID Administrative Coordinator:

The next U.S. NRC Team is ready to leave for Japan on Tuesday, April 12. The following six NRC experts should be considered "emergent" (sic). Please expedite their travel.

Steve Garchow (from NRC's Region IV);
Heather Gepford (from NRC's Region II);
Tony Huffert (from NRC's Office of Research);
Jeff Mitman (from NRC's Office of Nuclear Reactor Regulation); and
Carl Moore and Steve Reynolds (both from NRC's Region III)

NRC's Brian Wittick already left on Saturday, April 9.

LIA02

JJJ | 302

From: LIA03 Hoc REL
Sent: Sunday, April 10, 2011 4:37 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: Document2

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 4:37 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Document2

From: LIA06 Hoc
Sent: Sunday, April 10, 2011 4:37 PM
To: LIA07 Hoc
Cc: LIA02 Hoc
Subject: RE: Document2

Yes.

Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

From: LIA07 Hoc
Sent: Sunday, April 10, 2011 4:35 PM
To: LIA06 Hoc
Subject: RE: Document2

Is "DOS-HQ" the Dept of State Headquarters?

From: LIA06 Hoc
Sent: Sunday, April 10, 2011 2:26 PM
To: LIA07 Hoc
Cc: LIA06 Hoc
Subject: Document2

Attached is the LT's update for our section of the SITREP.

Mark Lombard
Liaison Team Director
U.S. Nuclear Regulatory Commission
Operations Center

JJJ/303

From:	LIA10 Hoc
Sent:	Sunday, April 10, 2011 4:07 PM
To:	LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject:	FW: OUO: Transition Report April 10, 0600-1530

From: LIA03 Hoc
Sent: Sunday, April 10, 2011 4:07 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: OUO: Transition Report April 10, 0600-1530

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 4:07 PM
To: Mamish, Nader; Doane, Margaret; LIA03 Hoc
Cc: 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; LIA08 Hoc; LIA06 Hoc
Subject: OUO: Transition Report April 10, 0600-1530

~~OFFICIAL USE ONLY~~

TRANSITION REPORT FOR APRIL 10, 0630 - 1530
Elizabeth to Gerri

Updates during Shift

- A draft paper prepared by the Site Team's Michel Hay, entitled "NRC Response to Fukushima Event," (subject line "Global Assessment") was forwarded to a number of stakeholders. LIA02 provided edits, then forwarded the draft to International Liaisons for their review and comment. This document does not yet include RST input, but that is in the works. Action: track comments and status of report. Send IAEA Liaison final draft.

  - **Fourth Team to Japan.** Members for team#4 will leave this week. Brian Wittick left on 4/9; Steve Garchow (RIV), Heather Gepford (RII), Tony Huffert (RES), Jeff Mitman (NRR), Carl Moore (RIII), and Steve Reynolds (RIII) will leave on 4/12. A heads up was sent from Karen Jackson on 4/10 noting that USAID was not working over the weekend, and normally needs 4 days to process travel. USAID is the funding source. **Action:** Contact USAID and tell them (as per request from Marty Virgilio) that all 6 travelers who are yet to be departed are to be considered "emergent" (sic) and to please expedite their travel. Monitor USAID for response; inform team#4 travelers of results. Added Team #4 additional emergency contact information to both the Japan Traveler Contact/Emergency contact information file. Was contacted by several of the travelers with checklist questions and general info, esp. related to arranging travel. Put them in touch with Mary Carter of OIP and others who can help coordinate and answer questions. Forwarded requests for blackberries to Karen Jackson; they are being processed. Also update Team#4 grid as requested traveler information comes in. Other travelers may emerge.

- **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

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United States. The State Department is the lead in the "Consortium." INPO is the lead on equipment issues. Although 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. On April 5th, LT received the latest equipment request matrices from USAID, originated by the Tokyo embassy. During April 5th conference call, OMB indicated to LT that they intend to start approving all finances for equipment purchases for Japan.

- **Watch schedule is changing in Ops Center.** The line organization will be involved more, and work in the Ops Center will include fewer people (6 people). An overall report defining changes to the Watch schedule and strategy is being developed by the ET. Outlook has been changed so that all three International Desk computers receive all email sent to each computer. There are folders for the other computers. This will capture all the messages and allow us to avoid checking more than one computer. **ACTION:** The OIP checklist will need to be changed regarding whom to contact for obtaining blackberries, laptops, etc., as Karen Jackson on ET02 Hoc will no longer be that person (someone within OIS should be identified by management). Karen said a transfer plan should be set up such that the blackberries remain in Japan, but get reset using new travelers' email accounts from our end as team members are replaced.

- **Mailbox size limits**. Team requested verification that mailboxes had size limits increased due to difficulties sending emails. On 4/7 received response from Joe Turner/OIS that email box sizes for those in Japan are being monitored daily for max capacity. **Action:** Notified Joe Turner about Team#4 travelers. Notify Joe Turner as new travelers are identified to leave for Japan.

- **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 (sent during day shift on 4/10).

- **TEPCO Earthquake Info.** Vince Holahan, the NRC staff member embedded with PACCOM, has requested to be on the distribution list for the Japanese earthquake info sent from TEPCO. **Action:** Please forward these emails to Vince.Holahan@nrc.gov as they are received (sent during day shift on 4/10).

- **Request to Share RST Document with Foreign Governments:** The Governments of Canada, the UK and Finland have requested that the RST share their "Stability Document," which they have discussed during their daily call with these governments. The request was forwarded to the ET, who is assessing what information is contained in the document before deciding on whether or not to share the document. The document is still in draft (awaiting interagency comments). PMT was given permission to read the draft document to conference call members. Release of this document will be addressed as part of the process being developed to address the release of a document to NY Times. **Action:** Continue to follow. **UPDATE (correction)**: The RST Stability Document was not released to Mark Shaffer (as was previously reported). When the RST Stability Report section is completed, the final draft should be sent to Mark Shaffer, along with the requestors from Canada, UK, and Finland, as well as the Japan team.

- **1 Pager for Margie's Morning Meeting –** Danielle/Eric requested that the draft be sent to them to add to it overnight. They will send back updates via email. **Action:** Work off of the draft sent back from them. A final is in the works for the 4/10/11 one-pager, including Danielle's additions. (In future iterations, if they don't send back any updates overnight, then work off of the draft completed.)

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 neither 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.

- **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.

- **Translators.** 24/7 translation coverage in the HOC has been suspended. Mike Call who is in Japan until 4/16 speaks Japanese. At HQ there is a Japanese foreign assignee and other options available. Also, Tony Nakanishi may be available to provide translation assistance. 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:** If in need of USAID translation support, fax the document to +81-3-3224-5538 and send a scanned (PDF) copy to the Japan site team as a backup.

- **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 is still the 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.

- **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 4/5 it was **2100** 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.**

- **Laptop shuffling in Japan.** Some laptops (the blue-top ones) still have difficulty printing so the ground team has requested the assistance of CSC in "re-assigning" the laptops that work well to the members of the 3rd team (since the 2nd team members leave Japan by 4/13). **ACTION:** No action for OIP but we may be requested to assist if there are any difficulties. We should also note that if future teams go to Japan, they should take non-blue-top or personal laptops to make it easier to connect to the Embassy printer.

- **Update Japan Traveler Information Document on LIA02 with Return Team info** – from LT Director please update the traveler table as NRC Japan Travel Team members return to U.S. **ACTION:** Await reply emails from returned travelers and update the Document on LIA02.

- **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. The policy to delay meeting will be articulated by DOS high level representatives at a G-20 meeting in Abu Dhabi the week of April 4. 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.

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.
- Reminder to keep ISN/NESS on the distribution list for the NRC Japan situation reports ISN-NESS-DL@state.gov.
- Keep RST and PMT 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.
- OIP has been tasked with providing IAEA ENAC daily summary to Commissioner's TAs and EDO POC. OIP is also being asked to place a cover page on this report indicating the sensitivity of the information. The document will be provided by email.

OF~~FICIAL USE~~ ONLY

Trapp, James

From:	LIA07 Hoc
Sent:	Monday, April 11, 2011 4:29 AM
To:	LIA07 Hoc
Subject:	USNRC Earthquake/Tsunami Status Update: 0430 EDT, April 11, 2011
Attachments:	USNRC Earthquake-Tsunami Update 041111 0430EDT.pdf

Attached, please find a 0430 EDT, April 11, 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.

Yen

Yen Chen
Executive Briefing Team Coordinator
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)

JJJ|305

From: LIA10 Hoc
Sent: Monday, April 11, 2011 3:42 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: HOO to Return to Normal Dosimetry Process

From: LIA02 Hoc
Sent: Monday, April 11, 2011 3:42 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: HOO to Return to Normal Dosimetry Process

From: O'Donnell, John
Sent: Monday, April 11, 2011 3:42 PM
To: LIA02 Hoc; Young, Francis; Administrative ServicesCenter
Cc: Pedersen, Roger; Garry, Steven; Bartlett, Matthew; Thompson, Richard; Hinson, Charles; Struckmeyer, Richard; Foster, Jack
Subject: HOO to Return to Normal Dosimetry Process

Steve and Francis,

The normal dosimetry issuance process you requested is below. This is the overview and the RSOs can provide the individuals with the details for their offices.

Obtaining an NRC Dosimeter @ HQ

1. Obtain a Dosimeter Authorization Form.
    a. The following offices have internal procedures that include this form.
        i. NRR ADM-403
        ii. NRO NRO-ADM-110
        iii. FSME ML101040309
        iv. NMSS NMSS Dosimeter Authorization
    b. The Administrative Services Center (ASC) also has dosimeter request forms available at the ASC Services Desk in the 2nd Floor Lobby of OWFN.

2. Complete the individual information requested and duties requiring a dosimeter.

3. Acknowledge that appropriate training is current.
    a. At a minimum, discuss with the RSO the radiological hazards of the duty.
    b. Should not need KI, but if need perceived, review the guidance in Exhibit 3 and cautions in Exhibit 4 of MD 10.131.
    c. Should not need respiratory protection, respirators require medical qualification. This does not include dust masks.

4. Review the guidelines for use of dosimeters (should be a separate page).
    a. Do not place in checked luggage
    b. Keep on person, if possible.
    c. Wear on upper portion of trunk of body

JJJ/306

5. Sign the form
    a. Obtain your Office RSO or ARSO signature for dosimeter authorization
    b. The RSO retains a copy for office records.

6. The individual must present the completed form to the ASC staff (OWFN 2nd Floor Lobby)
    a. The ASC will issue the temporary dosimeter to the individual from the ASC Services Desk.
    b. This service is not always immediately available, so please plan accordingly. (1 to 24 hours is best.)
    c. ASC hours are M-F, 7:15 am to 5:00 pm. Phone 301-415-2251.

The dosimeter wear period is quarterly beginning on the 1st day of January, April, July and October. The dosimeters must be returned to the ASC at the end of each quarter.

The Headquarters RSOs and ARSOs are listed below by office.

Office	**RSO**	**ARSO**
NRR	Roger Pedersen	Steven Garry
NMSS	Matt Bartlett	Richard Thompson
FSME	John O'Donnell	Richard Struckmeyer
NRO	Charles Hinson	

Note: HQ personnel in Offices other than those listed above should contact the NRR RSO for dosimetry guidance.

Regards,

John O'Donnell
301-415-7908

From: OST01 HOC
Sent: Monday, April 11, 2011 11:31 AM
To: HOO Hoc
Subject: RE: Toshiba Scans
Attachments: image001.jpg

Thank you!

-Melissa

From: HOO Hoc
Sent: Monday, April 11, 2011 11:31 AM
To: OST01 HOC
Subject: Toshiba Scans

Melissa—Here are the scans.

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: 301-816-5100
Fax: 301-816-5151
email: hoo.hoc@nrc.gov
secure e-mail: hoo@nrc.sgov.gov

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

JJJ|307

From:	LIA03 Hoc
Sent:	Monday, April 11, 2011 12:24 PM
To:	LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject:	FW: [METI Japan](Apr_11)Update on Seismic and Tsunami Damage Information
Attachments:	[METI] Apr 8_0800_Tohoku-Pacific Ocean Earthquake and the Seismic Damages to the NPSs.pdf; Apr_11 Radioactivity Level Map [Chart].pdf

-----Original Message-----
From: LIA02 Hoc
Sent: Monday, April 11, 2011 12:24 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: [METI Japan](Apr_11)Update on Seismic and Tsunami Damage Information

-----Original Message-----
From: meti-info@meti.go.jp [mailto:meti-info@meti.go.jp]
Sent: Monday, April 11, 2011 12:13 PM
To: meti-info@meti.go.jp
Subject: [METI Japan](Apr_11)Update on Seismic and Tsunami Damage Information

For your reference, Ministry of Economy, Trade and Industry of Japan (METI) is providing latest information on the seismic and tsunami damages to the nuclear power stations (NPSs) in Japan, including those caused to Fukushima Dai-ichi NPS.

This Monday, the following information has been updated.

---- Today's news ----
We have regular updates as follow.

---- Updates from METI ----
1. [METI] Apr 8_0800_Tohoku-Pacific Ocean Earthquake and the Seismic Damages to the NPSs [Please refer to the attached file]

2. [METI] Apr 11_Radioactivity Level Map Chart [Please refer to the attached file]

---- Updates from NISA ----
3. [NISA] Apr 11 1500_Current Situation of Onagawa, Fukushima Dai-ichi, Fukushima Dai-ni, Tokai Dai-ni NPSs (only Japanese version is now available. English version will be uploaded.)
http://www.meti.go.jp/press/2011/04/20110411007/20110411007-1.pdf

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[NISA] Apr 8 0800_Current Situation of Onagawa, Fukushima Dai-ichi, Fukushima Dai-ni, Tokai Dai-ni NPSs (English version) http://www.nisa.meti.go.jp/english/files/en20110411-1-1.pdf

4. [NISA] Apr 11 0200_Fukushima Dai-ichi Major Parameters of the Plant (only Japanese version is available. English version will be uploaded.) http://www.meti.go.jp/press/2011/04/20110411003/20110411003-3.pdf

[NISA] Apr 8 0600_Fukushima Dai-ichi Major Parameters of the Plant (English version) http://www.nisa.meti.go.jp/english/files/en20110411-1-3.pdf

---- Major Updates from other agencies of Japanese Government --- 5. [MLIT] Apr 11 PM_Measurement of Radiation Doses in the Ports around Tokyo Bay http://www.mlit.go.jp/kowan/kowan_fr1_000041.html
Currently, the level of radiation in Tokyo City, Yokohama City, Kawaski City and Ichikawa City (Chiba) were as shown in the attachment at very safe level to health.

6. [MLIT] Apr 11 PM_Measurement of radiation doses around the Metropolitan Airports http://www.mlit.go.jp/koku/koku_tk7_000003.html
The current level of radiation does not have any effects on human health.

7. [NSC] Apr 10 1645_Assessment of the result of environment monitoring (only Japanese version is available) http://www.nsc.go.jp/nsc_mnt/110410_1.pdf

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If you need to add other e-mail address to this mailing list or do not need our information mail any more, please contact at meti-info@meti.go.jp

==
International Public Relations Team
Ministry of Economy, Trade and Industry (METI)
1-3-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-8901, Japan E-mail : meti-info@meti.go.jp
==
(See attached file: [METI] Apr 8_0800_Tohoku-Pacific Ocean Earthquake and the Seismic Damages to the NPSs.pdf)

(See attached file: Apr_11 Radioactivity Level Map [Chart].pdf)

Tohoku Pacific Earthquake and the seismic damage to the NPSs

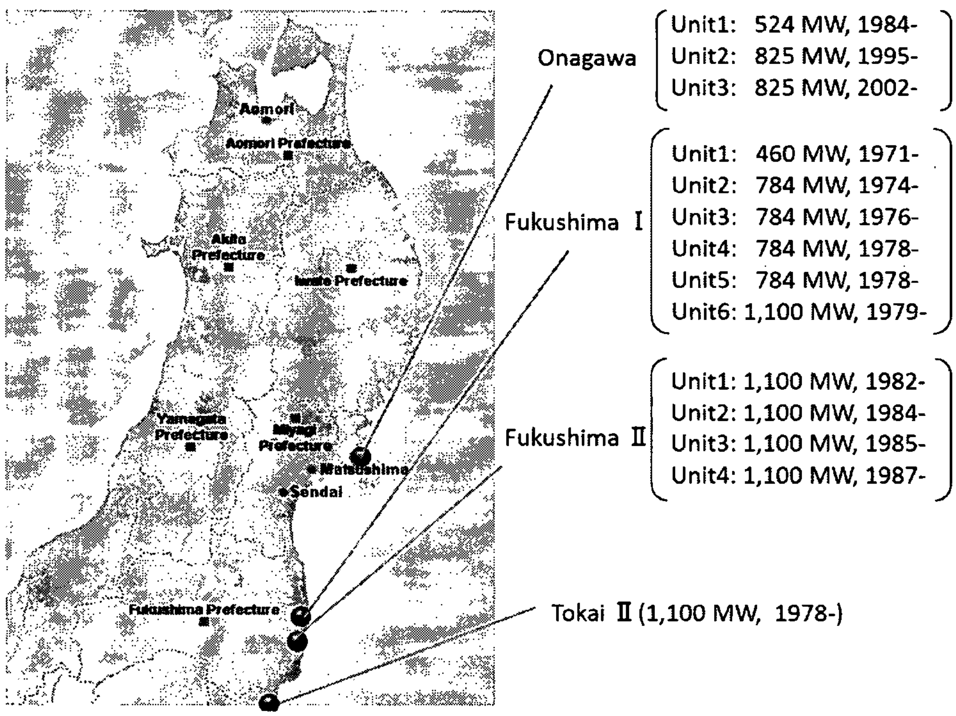
As of 8:00am April 8th, 2011 (JST)
Ministry of Economy, Trade and industry

Earthquake and automatic shut-down of nuclear reactors

The Tohoku Pacific Earthquake of historic magnitude 9.0 struck the northeastern part of Japan at 14:46 on March 11th, 2011.

At the time of the earthquake occurrence, 3 reactors (Units 4, 5 and 6 at Fukushima Dai-ichi (I) Nuclear Power Station (NPS) of Tokyo Electric Power Co. Inc.(TEPCO)) were under periodic inspection outage, and 11 reactors (Units 1, 2 and 3 at Onagawa NPS of Tohoku Electric Power Co. Ltd.; Units 1, 2 and 3 at Fukushima I NPS of TEPCO; Units 1, 2, 3 and 4 of Fukushima Dai-ni (II) NPS of TEPCO; and an unit of Tokai Dai-ni (II) NPS of Japan Atomic Power Co. Ltd.) were automatically shut-down.

After the automatic shut-down, Units 1, 2 and 3 at Onagawa, Unit 3 at Fukushima II, and the Unit at Tokai II have been cold shut down safely. As for the Units 1, 2 and 4 at Fukushima II, TEPCO operator of the station reported the nuclear emergency situation to Nuclear and Industrial Safety Agency (NISA), but afterward the three units have been cold shut down.



Tsunami damaged the cooling systems at the Fukushima Dai-ichi (I)

Since the external power supply was cut off upon the earthquake occurrence at 14:46 on March 11th, the emergency diesel power generators at Fukushima I automatically started generating electricity and the cooling systems began their operation. Then, the massive earthquake triggered the devastating Tsunami wiping away houses, buildings, cars along the widespread areas of the northeast coast.

The emergency diesel power generators and the pumps supplying seawater to the cooling system were halted at 15:41 on March 11th due to the Tsunami estimated more than 10 meters high from the seawater level. Fukushima I lost the AC power sources for Unit 1, 2, 3 and 4 and lost function necessary for cooling down the reactor cores (Unit1,2 and 3) and spent fuel kept in the pools (Unit1,2,3 and 4) inside reactor buildings. Consequently, the pressure and temperature of reactor cores and the water temperature of spent fuel pools went up.

For counter measures, water is being injected into the reactor pressure vessels of Units 1, 2 and 3. At the same time, police, fire brigade and the Self Defense Forces are attempting to pour water into the spent fuel pool of Units 3 and 4 by spraying seawater from helicopters, water cannon trucks and fire engine. Further, TEPCO engineers are working to restore external power supply to Units 1, 2, 3 and 4 (power supply to Units 5 and 6 was completed) by installing the electricity cable connecting to the transmission line of Tohoku Electric Power Co. Ltd. and other transmission route.

Unit 1 Fresh water is being injected to the spent fuel pool and the reactor pressure vessel.

- After the reactor was automatically shut-down and the Tsunami disabled the equipments, the temperature of the reactor core went up and the water level inside the pressure vessel dropped and the reaction of cladding metal of fuel and water generated hydrogen. Vent of the primary containment vessel was operated at 10:17am on March 12th. The hydrogen leaked outside of the containment vessel and caused the explosion at the upper-part of a concrete building housing at 15:36 on March 12th.

- Seawater was being injected into the reactor pressure vessel; thereafter, fresh water is being injected as of 8:00am April 8th, instead of seawater. On March 29th, the pump for the fresh water injection was switched from the fire pump truck to the temporary motor-driven pump.

- On March 31st, spray of fresh water over the spent fuel pool of Unit 1 using the concrete pump truck was carried out. On April 2nd, a test water spray over the spent fuel pool was carried out in order to confirm the appropriate position for water spray.

- Lighting in the main control room was recovered on March 24th. On April 2nd, lighting in the turbine building was partially turned on. And the power supply for the fresh water injection to the reactor pressure vessel was switched to the external power supply on April 3rd.

- White smoke was confirmed to generate continuously as of 6:30am April 8th.

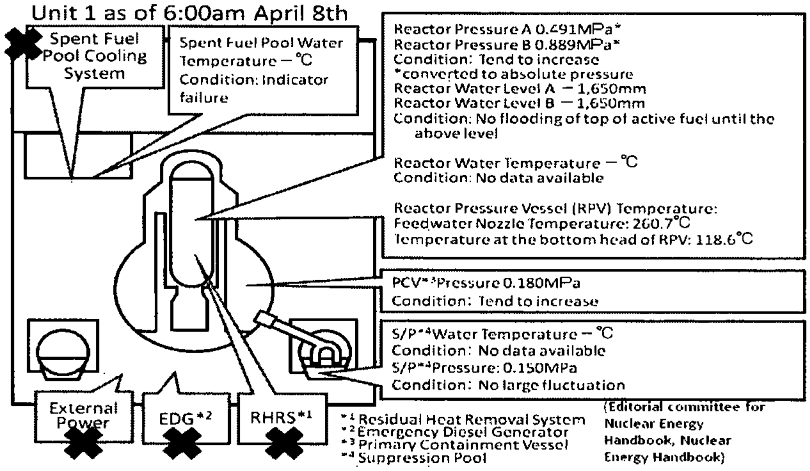
- As the result of concentration measurement in the stagnant water on the basement floor of the turbine building, 2.1×10^{5}Bq/cm^{3} of ^{131}I (Iodine) and 1.8×10^{6}Bq/cm^{3} of ^{137}Cs (Caesium) were detected as major radioactive nuclides. Since around 17:00 March 24th, the stagnant water has been transferred to the condenser. As the condenser was confirmed to be almost filled with water, pumping out the water to the condenser was stopped at 7:30am on 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 was 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) Thereafter, the water in the condenser was transferred to the condensate storage tank at 13:55 on April 3rd.

- Aiming at reducing the possibility of hydrogen combustion in the primary containment vessel of Unit 1, the operations for the injection of nitrogen to the vessel were started at 22:30 on April 6th.

- The start of nitrogen injection to the primary containment vessel of Unit 1 was confirmed. (1:31am April 7th)

Unit 1 as of 6:00am April 8th



Unit 2 Fresh water is being injected to the spent fuel pool and the reactor pressure vessel.

- After the automatic shut-down of the reactor, the water injection function was sustained, but the reactor water level tended to decrease. And vent of the primary containment vessel was operated at 11:00am on March 13th and at 0:02am on March 15th.
- At 6:10am on March 15th, TEPCO reported that there was an explosion sound at Unit 2. Given the fact that the pressure in the suppression chamber decreased, it is presumed that there is possibility of certain damage on the suppression chamber.
- Seawater was being injected into the reactor pressure vessel; thereafter, fresh water is being injected as of 8:00am April 8th, instead of seawater. On March 27th, the pump for the fresh water injection was switched from the fire pump truck to the temporary motor-driven pump.
- The seawater injection to the spent fuel pool of Unit 2 using the fire pump truck was switched to the fresh water injection using the temporary motor-driven pump on March 29th. On March 30th, April 1st, 4th and 7th, the injection of fresh water to the spent fuel pool via the spent fuel cooling line were carried out. At 3:00am on April 8th, the temperature in the spent fuel pool was 63.0 degree centigrade.
- The power center of Unit 2 received electricity on Match 20th. On March 26th, lighting of the main control room was recovered. On April 2nd, lighting in the turbine building was partially turned on. And the power supply for the fresh water injection to the reactor pressure vessel was switched to the external power supply on April 3rd.
- White smoke was confirmed to generate continuously as of 6:30am April 8th.
- In order to prepare for transferring the stagnant water on the basement floor of turbine building 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 11:50am April 1st. Thereafter, the water in the condenser was transferred to the condensate storage tank at 17:10 on April 2nd, and 13:55 on April 3rd.
- One more pump for the transfer of the water in the condenser of Unit 2 to the condensate storage tank was installed at 15:40 April on 5th.
- 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. (as of around 9:30 April 2nd) In order to stop the outflow, concrete was started to be poured into the pit. (16:25 and 19:02 April 2nd)
- As the measure to prevent the outflow of the water accumulated in the pits for conduit in the area around the inlet bar screen of Unit 2, the upper part of the power cable trench for power source at the intake channel was crushed and sawdust, high polymer absorbent and cutting-processed newspaper were put inside. (From 13:47 till 14:30 April 3rd)
- 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 at 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 at 15:07 April 5th. The outflow of the water was confirmed to stop at around 5:38am 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)

Unit 3 Fresh water is being injected to the spent fuel pool and the reactor pressure vessel.

- After the automatic shut-down of the reactor, fresh water and subsequently seawater were injected into the reactor pressure vessel through the fire extinguishing system line. And vent of the primary containment vessel was operated at 20:41 on March 12th, at 8:41am on March 13th and at 5:20am on March 14th. However, the pressure in the primary containment vessel rose up unusually and the explosion took place around the reactor building at 11:01am on March 14th.

- On March 16th, 21st and 23rd, the smoke (sometimes whitish, grayish or slightly blackish one) was generated from Unit 3 and died down. As of 6:30am April 8th, white smoke was confirmed to generate continuously.

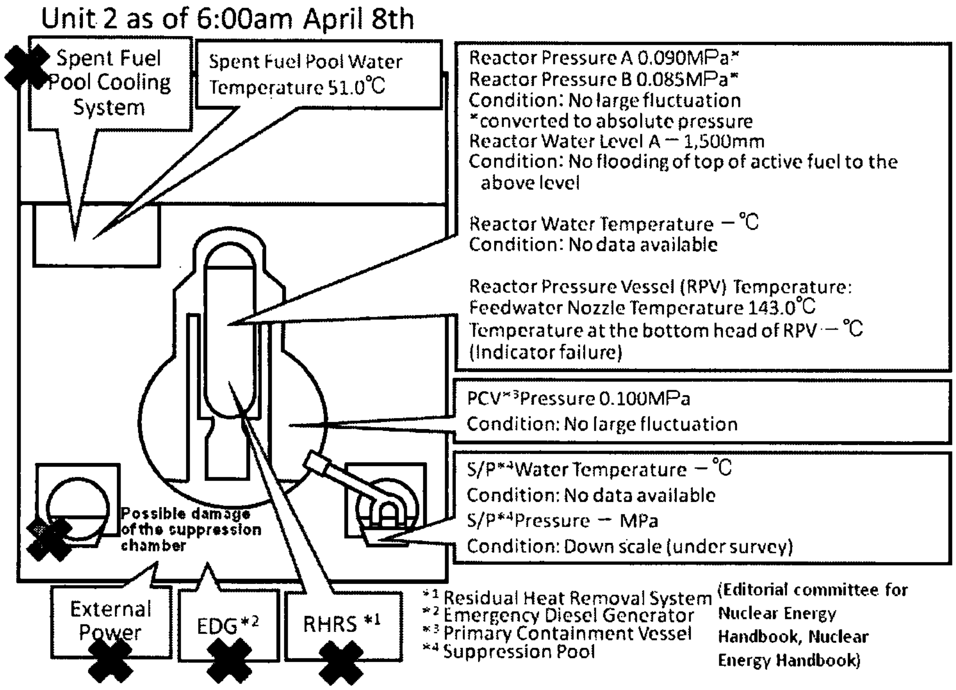
- For counter measures, seawater was being injected into the reactor pressure vessel, thereafter; fresh water was being injected from March 25th, instead of seawater. On March 28th, the pump for the fresh water injection was switched from the fire pump truck to the temporary motor-driven pump. Fresh water is being injected as of 8:00 April 8th.

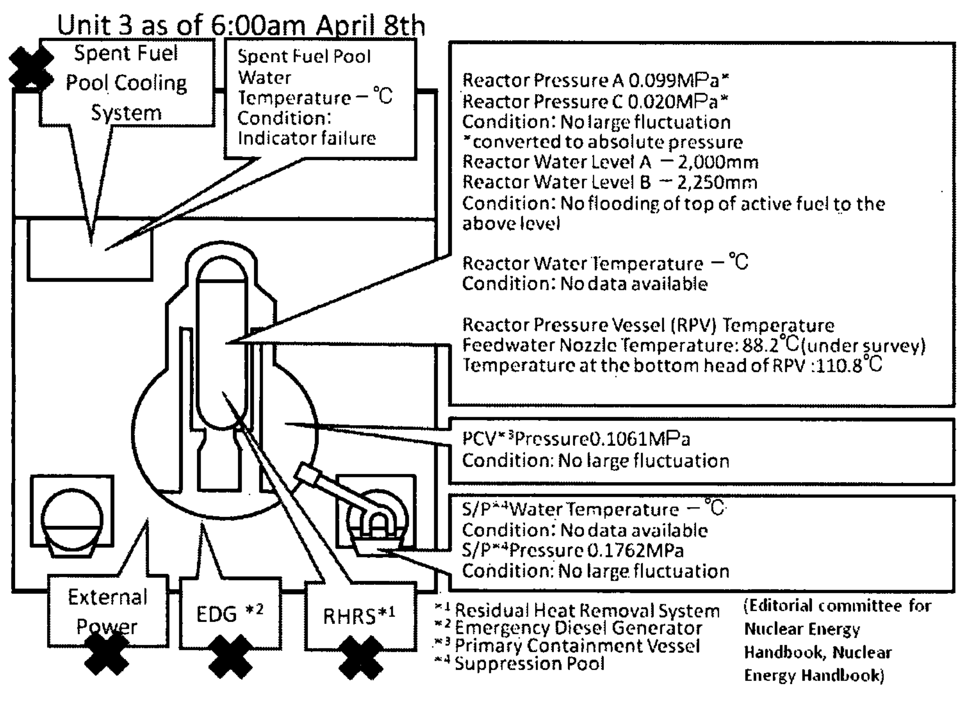
- At the same time, to pour water into the spent fuel pool, helicopters, water cannon trucks, fire engines and concrete pump trucks discharged water to the spent fuel pool of Unit 3 from sky and ground. Injection of seawater to the spent fuel pool via the cooling and purification line was carried out on March 23rd and March 24th. From March 29th till April 7th, fresh water spray over the spent fuel pool using the concrete pump truck had been carried out five times.

- The pressure in the primary containment vessel of Unit 3 rose. (320 kPa as of 11:00 March 20th) Judging from the situation, immediate pressure relief was not required, and monitoring of the pressure continues. (106.1 kPa as of 1:30am April 8th)

- Works for the recovery of external power supply is being carried out. At 22:43 on March 22nd, lighting in the main control room was recovered. On April 2nd, lighting in the turbine building was partially turned on. And the power supply for the fresh water injection to the reactor pressure vessel was switched to the external power supply at 12:18 on April 3rd.

- In order to prepare for transferring 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 till around 8:40am March 31st.


Unit 2 as of 6:00am April 8th
Spent Fuel Pool Cooling System
Spent Fuel Pool Water Temperature 51.0℃
Reactor Pressure A 0.090MPa*
Reactor Pressure B 0.085MPa*
Condition: No large fluctuation
*converted to absolute pressure
Reactor Water Level A − 1,500mm
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 143.0℃
Temperature at the bottom head of RPV − ℃
(Indicator failure)
PCV*3 Pressure 0.100MPa
Condition: No large fluctuation
S/P*4 Water Temperature − ℃
Condition: No data available
S/P*4 Pressure − MPa
Condition: Down scale (under survey)
Possible damage of the suppression chamber
External Power
EDG*2
RHRS *1
*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Primary Containment Vessel
*4 Suppression Pool
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)


Unit 3 as of 6:00am April 8th
Spent Fuel Pool Cooling System
Spent Fuel Pool Water Temperature − ℃
Condition: Indicator failure
Reactor Pressure A 0.099MPa*
Reactor Pressure C 0.020MPa*
Condition: No large fluctuation
*converted to absolute pressure
Reactor Water Level A − 2,000mm
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: 88.2℃(under survey)
Temperature at the bottom head of RPV :110.8℃
PCV*3 Pressure 0.1061MPa
Condition: No large fluctuation
S/P*4 Water Temperature − ℃
Condition: No data available
S/P*4 Pressure 0.1762MPa
Condition: No large fluctuation
External Power
EDG *2
RHRS*1
*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Primary Containment Vessel
*4 Suppression Pool
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Unit 4 No fuel is in the reactor pressure vessel. Fresh water is being injected to the spent fuel pool.

- There is no fuel in the reactor pressure vessel due to replacement work of the shroud.

- The temperature of water in the spent fuel pool went up. At 4:08am on March 14th, the temperature in the spent fuel pool of Unit 4 was 84 degree centigrade.

- It was confirmed that a part of wall of the operation floor of the reactor building of Unit 4 was damaged at 6:14am on March 15th. A fire took place at Unit 4 at 9:38am, but the fire was extinguished spontaneously as of 11:00am. And at 5:45am on March 16th, it was reported that a fire occurred at Unit 4; however, no fire was confirmed by TEPCO staff on the ground at 6:15am.

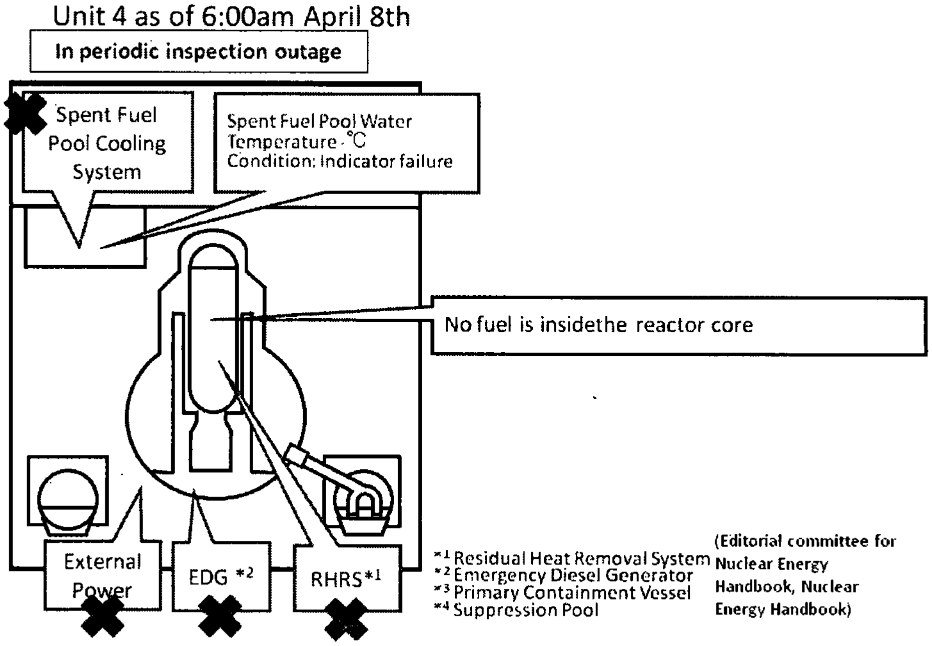
- White smoke was confirmed to generate continuously as of 6:30am April 8th.

- Water spray over the spent fuel pool of Unit 4 by Self-Defense Force was carried out three times from March 20th till March 21st. And water spray using a concrete pump truck had been carried out five times with seawater from March 22nd till March 27th and five times with fresh water from March 30th till April 7th. Injection of seawater to the spent fuel pool via the fuel pool cooling line was carried out on March 25th.

- The power center received electricity on March 22nd. On March 29th, lighting in the main control room was recovered. On April 2nd, lighting in the turbine building was partially turned on.

- From April 2nd, 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.(9:22am April 4th)

Unit 4 as of 6:00am April 8th



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

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

Unit 5&6 Unit 5 & 6 is under cold shut down.

- The emergency generator (B) for Unit 6 was operating and supplying electricity to Unit 5 and Unit 6. Fresh water was being injected into the reactor pressure vessels and the spent fuel pools by make-up water condensate system.

- The pump for residual heat removal system (RHR) (C) for Unit 5 and RHR (B) for Unit 6 started up on March 19th and recovered heat removal function. (power supply: emergency diesel generators for Unit 6)

- Unit 5 was under cold shut down at 14:30 and Unit 6 was under cold shut down at 19:27 on March 20th.

- Unit 5 and Unit 6 received electricity reached to the starting transformer on March 20th. The power supply of Unit 5 and Unit 6 was switched from the emergency diesel generator to the external power supply on March 21st and March 22nd.

- The temporary pump of RHR seawater system (RHRS) for Unit 5 was automatically stopped at 17:24 on March 23rd when the power supply was switched from the temporary to the permanent. Thereafter, repair of the temporary pump of RHRS was completed at 16:14 and cooling was started again at 16:35 on March 24th.

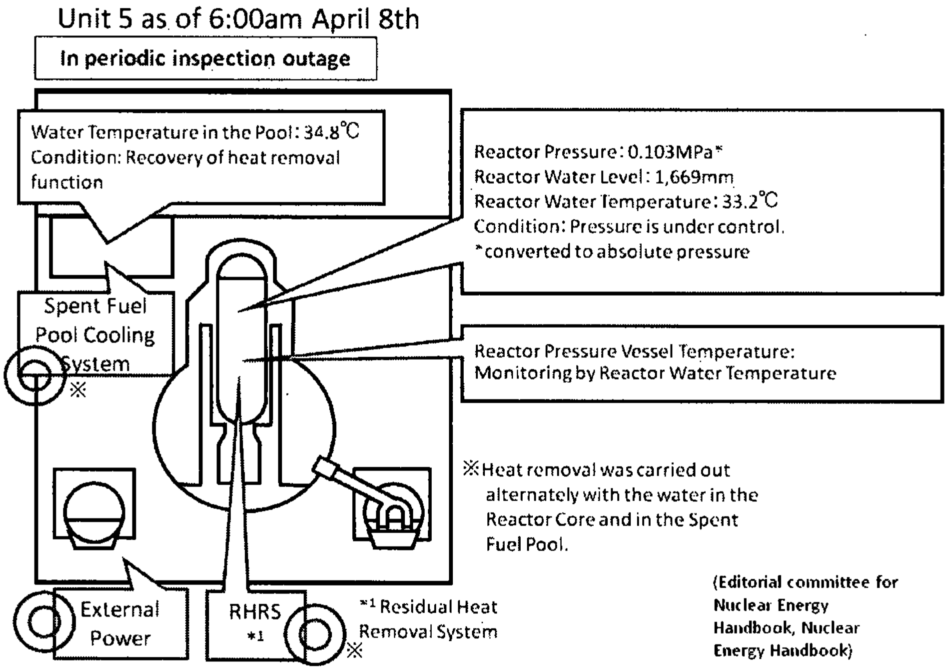
- Power supply for the temporary pumps for RHRS of Unit 6 was switched from the temporary to the permanent at 15:38 and 15:42 on March 25th.

- The temperature of water in the spent fuel pool of Unit 5 and Unit 6 were 34.8 degree centigrade and 28.0 degree centigrade, respectively as of 6:00am April 8th.

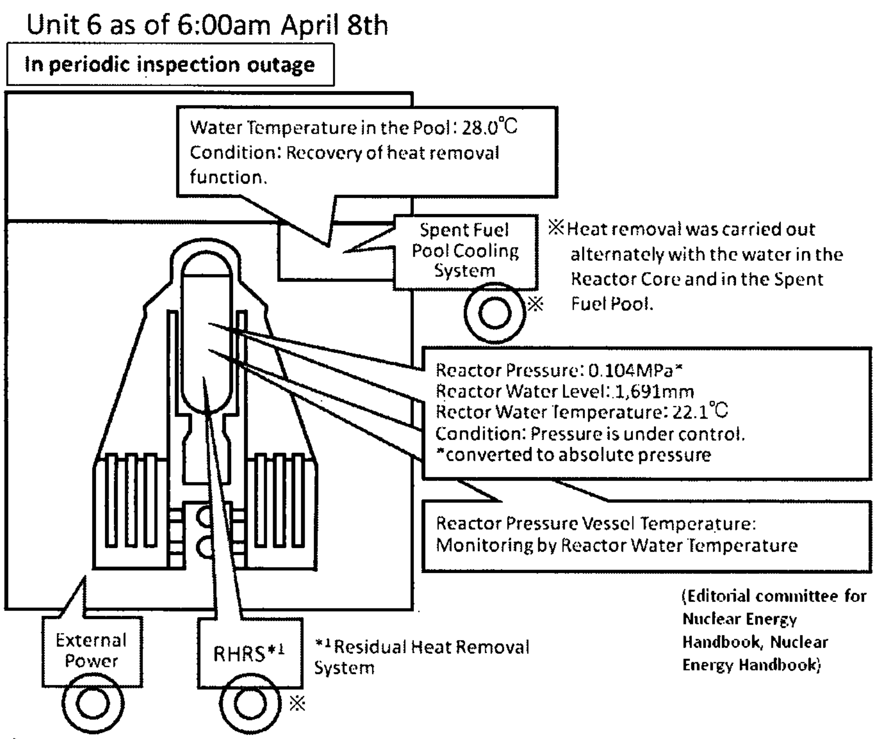
- The groundwater with low-level radioactivity in the sub drain pits of Units 5 and 6 (around 1,500t) was started to be discharged through the water discharge canal to the sea at 21:00 April 4th.

Common Spent Fuel Pool

- The power supply was started at 15:37 and cooling was also started at 18:05 on March 24th. As of 7:45am April 7th, the water temperature of the pool was around 28 degree centigrade.



Unit 5 as of 6:00am April 8th
In periodic inspection outage
Water Temperature in the Pool: 34.8℃
Condition: Recovery of heat removal function
Reactor Pressure: 0.103MPa*
Reactor Water Level: 1,669mm
Reactor Water Temperature: 33.2℃
Condition: Pressure is under control.
*converted to absolute pressure
Spent Fuel Pool Cooling System
※
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.
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)
External Power
RHRS *1
※
*1 Residual Heat Removal System



Unit 6 as of 6:00am April 8th
In periodic inspection outage
Water Temperature in the Pool: 28.0℃
Condition: Recovery of heat removal function.
Spent Fuel Pool Cooling System
※Heat removal was carried out alternately with the water in the Reactor Core and in the Spent Fuel Pool.
※
Reactor Pressure: 0.104MPa*
Reactor Water Level: 1,691mm
Rector Water Temperature: 22.1℃
Condition: Pressure is under control.
*converted to absolute pressure
Reactor Pressure Vessel Temperature: Monitoring by Reactor Water Temperature
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)
External Power
RHRS*1
*1 Residual Heat Removal System
※

Other

- As the result of nuclide analysis at around the southern water discharge canal, 7.4×10^1Bq/cm^3 of ^{131}I (1850.5 times higher than the limit of concentration of water outside the Environmental Monitoring Aria) was detected as of 14:30 March 26th. (As the result of measurement on March 29th, it was detected as 3355.0 times higher than the limit in water.)

- As the result of the analysis at the northern water discharge canal, 4.6×10^1Bq/ cm^3 of ^{131}I (1262.5 times higher than the limit) was detected as of 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 water of the Unit 1's 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 9:20am till 11:25 March 31st)

- In the samples of soil collected on March 21st and 22nd on the site (at 5 points) of Fukushima I, 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.

- 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}Pu (Plutonium), ^{239}Pu (Plutonium) and ^{240}Pu (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.

- 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.

- 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 Japan Maritime Self-Defense Force. (15:42 March 31st) The transfer of fresh water from the barge 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 carried out from 10:20am till 16:40 April 2nd.

- 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 Japan Maritime Self-Defense Force. (9:10am April 2nd)

- The spraying for test scattering of anti-scattering 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 freshwater was transferred from the barge (the second ship) of the US armed force to the other 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 (Around 10,000t) was started to be discharged from the southern side of the water discharge canal to the sea, using the first pump at 19:03 April 4th. Further, at 19:07 on the same day, the discharge using 10 pumps in total was carried out.
- 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)

Current Situation

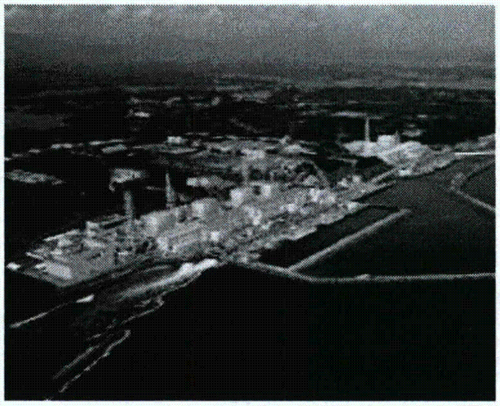
- Evacuation as far as 20 kilometers from Fukushima I NPS and 10 kilometers from Fukushima II NPS was almost completed (see the diagram "Fukushima prefecture"). The residents in the areas from 20 kilometers to 30 kilometers radius from Fukushima I NPS are directed to stay in-house.
- On March 16th, the Local Emergency Response Headquarter issued "the direction to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefecture Governors and the heads of cities, towns and villages.

Monitoring Data

1) The data of Monitoring Post out of 20 kilometers zone of Fukushima I NPS is available on the following website:
http://www.mext.go.jp/a_menu/saigaijohou/syousai/1303726.htm

2) The real-time radiation data collected via the System for Prediction of Environment Emergency Dose Information (SPEEDI) is available on the following website:
http://www.bousai.ne.jp/eng/

Outline of the Fukushima I Nuclear Power Station



(Fukushima Dai-ichi nuclear power station)

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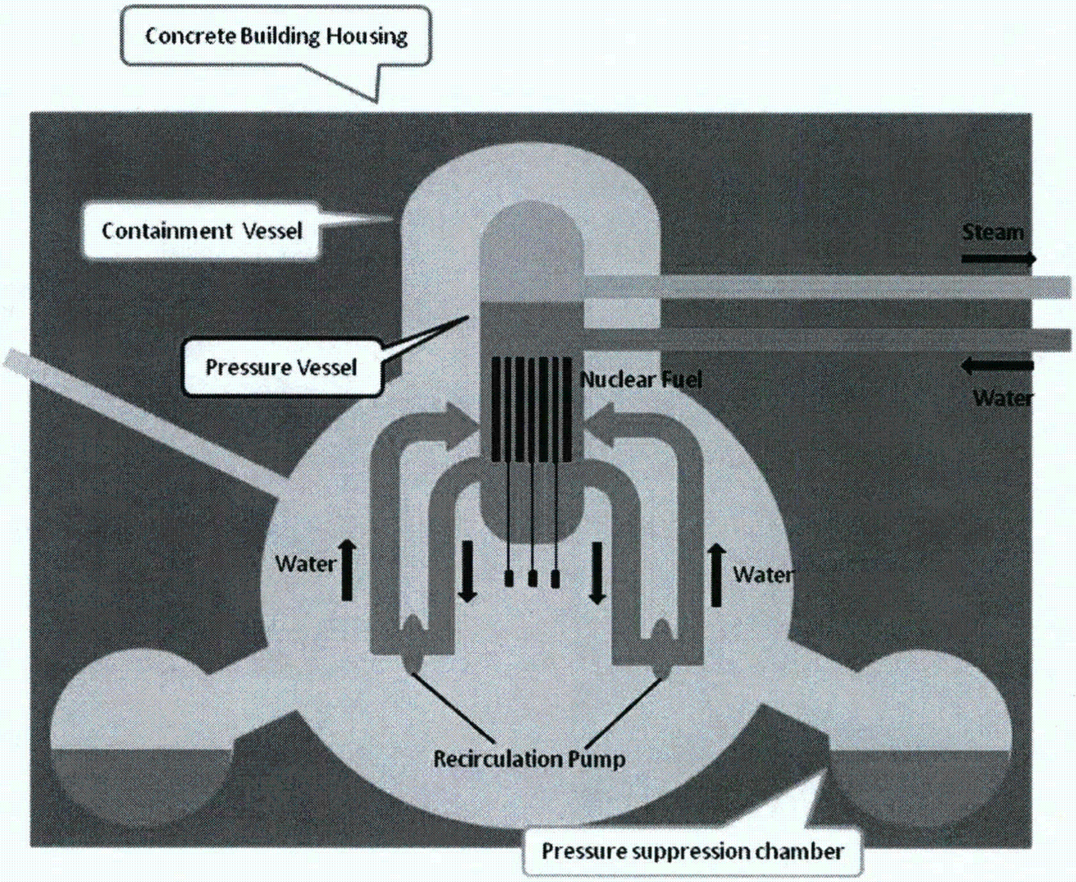
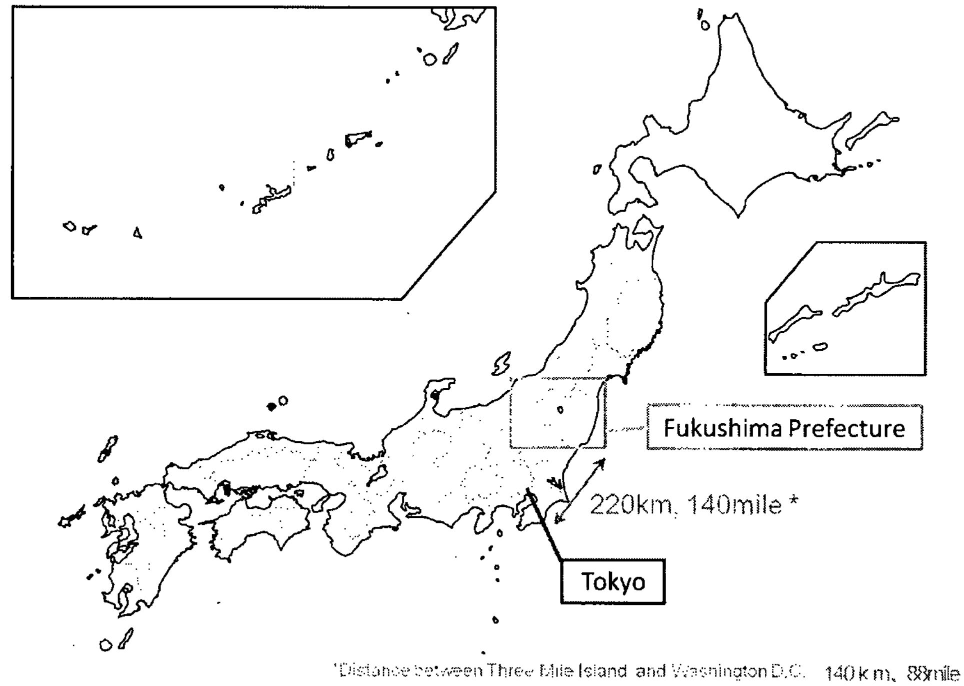
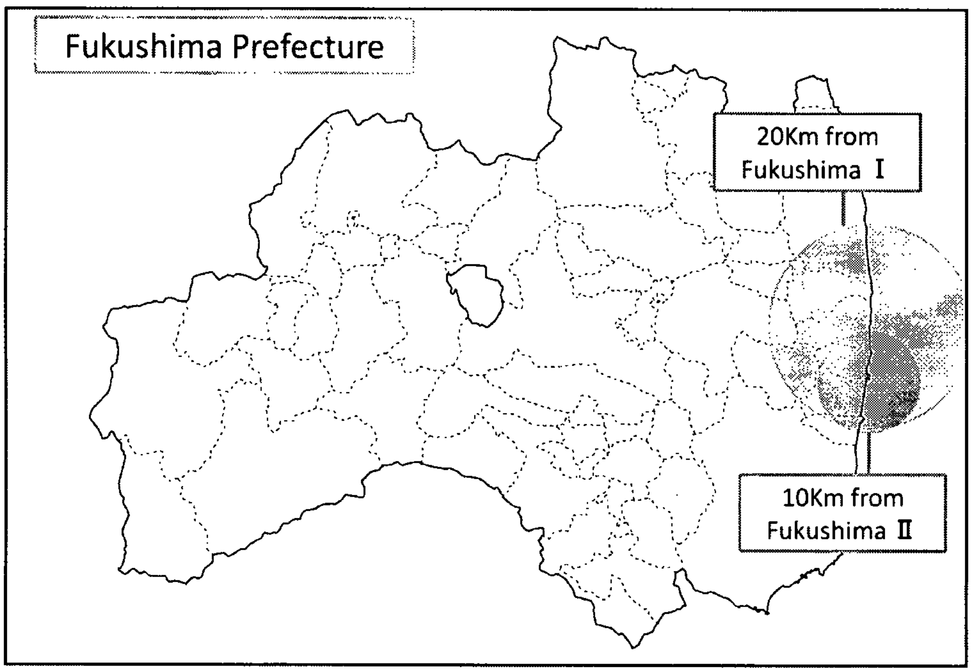


(Structure of BWR)

Location of Fukushima I and II in Japan

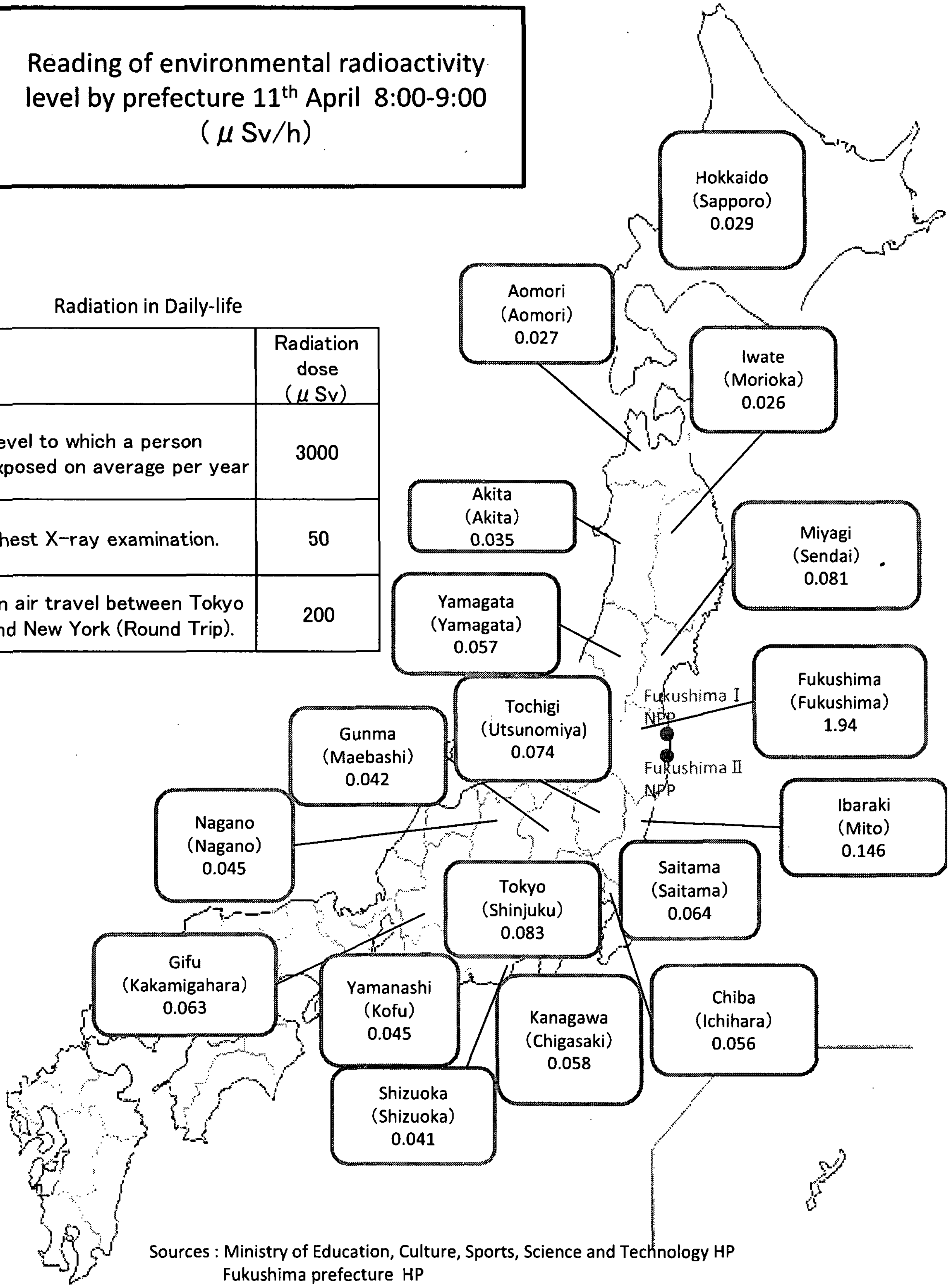




Reading of environmental radioactivity level by prefecture 11th April 8:00-9:00 (μ Sv/h)

Radiation in Daily-life

	Radiation dose (μ Sv)
Level to which a person exposed on average per year	3000
Chest X-ray examination.	50
An air travel between Tokyo and New York (Round Trip).	200



Sources : Ministry of Education, Culture, Sports, Science and Technology HP
Fukushima prefecture HP

From: LIA10 Hoc
Sent: Monday, April 11, 2011 3:04 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: Travel Reservations

From: LIA02 Hoc
Sent: Monday, April 11, 2011 3:04 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Travel Reservations

From: RMTPACTSU_AC [mailto:RMTPACTSU_AC@ofda.gov]
Sent: Monday, April 11, 2011 3:04 PM
To: LIA02 Hoc; Kozal, Jason
Cc: travel
Subject: Travel Reservations

When I made the reservations, we did not have the e-mail addresses for the travelers. I have now had our travel agent entered them into the reservation file and the travelers will receive e-mails directly whenever an action takes place.

The travelers may have received an e-mail around 3 p.m. immediately after the address was put in with a link to their reservation.

When things calm down a little, I will send you an update data collection form so we don't have to go back and forth so much on this in order to get the information we need.

JJJ|309

From: LIA03 Hoc
Sent: Monday, April 11, 2011 9:01 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: Daily: 3 New Items from Monday, April 11, 2011
Attachments: ~WRD000.jpg; image001.jpg; image002.jpg; image003.jpg; image004.jpg

From: NRC Announcement [mailto:nrc.announcement@nrc.gov]
Sent: Monday, April 11, 2011 9:00 PM
To: NRC Announcement
Subject: Daily: 3 New Items from Monday, April 11, 2011

Monday April 11, 2011 -- Headquarters Edition

- **Staff Changes: Temporary Senior Management Changes in Region II**
- **Employee Resources: Rotational Opportunity - NSIR/DSP/RSRLB, Senior Program Manager/Senior Security Specialist, GG-14/15**
- **Reminder: Event - Native American Advisory Committee Open House, April 13, 2011**

Staff Changes: Temporary Senior Management Changes in Region II

Yellow Announcement No. 045, "Temporary Senior Management Changes in Region II," is now available on the internal Web site under Yellow Announcements.

The following temporary appointments are announced:

Charles R. Ogle, Acting Deputy Regional Administrator for Construction
Jimi T. Yerokun, Acting Director, Division of Construction Inspection

This announcement can also be found in the ADAMS 2011 Yellow Announcements folder in the Main Library of the ADAMS Document Manager. In the folder, Yellow Announcements are arranged in report number order.

If you have difficulty accessing a Web link in this announcement, contact the NRC Announcement Coordinator, Beverly Martin, ADM/DAS, 301-492-3674.

JJJ/310

(2011-04-11 00:00:00.0) View item in a new window

Employee Resources: Rotational Opportunity - NSIR/DSP/RSRLB, Senior Program Manager/Senior Security Specialist, GG-14/15

The **Office of Nuclear Security and Incident Response** has a 3-month rotational assignment opportunity for current **GG-14 or GG-15** employees interested in an assignment as a **Senior Program Manager/Senior Security Specialist** in the **Reactor Security Rulemaking and Licensing Branch, Division of Security Policy.**

Detailed information is available on the NRC internal Web page.

If you have difficulty accessing a Web link in this announcement, contact the NRC Announcement Coordinator, Beverly Martin, ADM/DAS, 301-492-3674.

(2011-04-11 00:00:00.0) View item in a new window

Reminder: Event - Native American Advisory Committee Open House, April 13, 2011

Please join the Native American Advisory Committee (NAAC) for an Open House on April 13, 2011, from 11:30 a.m. to 12:30 p.m. in the TWFN exhibit area. Come enjoy free food (Indian Fry Bread!), drinks, and games.

NAAC members will be present to discuss the committee and to solicit volunteers. For additional information, please contact Jody Martin, Co-Chair, NAAC, at 301-415-1569.

(2011-04-11 00:00:00.0) View item in a new window

The latest Announcements are always on the NRC@WORK Home Page.

Announcements by Date | Announcements by Category

Search Announcements: term term [Go]

Frequently Asked Questions About the NRC Daily Announcements Email

From: LIA10 Hoc
Sent: Monday, April 11, 2011 8:12 AM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: Information for Travel

From: LIA03 Hoc
Sent: Monday, April 11, 2011 8:12 AM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: Information for Travel

From: LIA02 Hoc
Sent: Monday, April 11, 2011 8:12 AM
To: LIA03 Hoc; Young, Francis
Subject: FW: Information for Travel

From: LIA02 Hoc
Sent: Monday, April 11, 2011 8:10 AM
To: Garchow, Steve; Gepford, Heather; Huffert, Anthony; Mitman, Jeffrey; Moore, Carl; Reynolds, Steven
Subject: Information for Travel

All,

I will be contacting via you shortly via telephone, for the following information.

Full Name
Home Address
SSN

Passport #
Date and Place of Birth
Issue Date of Passport
Expiration Date of Passport
Place of Passport Issuance

Finally, since the Travel Authority will be USAID we need the following Banking information:

Account Name
Account Number
Routing Number

JJJ|311

Emergency Name and Number

Airport

Thank you,

Steve Bloom

From: LIA10 Hoc
Sent: Monday, April 11, 2011 2:01 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: Lists

From: LIA02 Hoc
Sent: Monday, April 11, 2011 2:00 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Lists

From: Kreuter, Jane
Sent: Monday, April 11, 2011 2:00 PM
To: LIA02 Hoc
Subject: RE: Lists

thanks

From: LIA02 Hoc
Sent: Monday, April 11, 2011 1:56 PM
To: Kreuter, Jane
Subject: Lists

JJJ|312

From: LIA10 Hoc
Sent: Monday, April 11, 2011 7:05 AM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: QUESTION: Continuation of Daily One-Page Summaries

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From: LIA02 Hoc
Sent: Monday, April 11, 2011 7:05 AM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: QUESTION: Continuation of Daily One-Page Summaries

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From: Mamish, Nader
Sent: Monday, April 11, 2011 7:05 AM
To: LIA02 Hoc; Doane, Margaret
Cc: Abrams, Charlotte; Emche, Danielle; Wittick, Brian; LIA08 Hoc
Subject: RE: QUESTION: Continuation of Daily One-Page Summaries

Unless others have different suggestions, my vote would be for the Japan team to provide the daily readout directly to Margie and I w/cc to Charlotte and Kirk.

Thanks

From: LIA02 Hoc
Sent: Sunday, April 10, 2011 11:26 PM
To: Doane, Margaret; Mamish, Nader
Cc: Abrams, Charlotte; Emche, Danielle; Wittick, Brian; LIA08 Hoc
Subject: QUESTION: Continuation of Daily One-Page Summaries

All,

Due to Op Center scheduling changes starting Monday, April 11, the Liaison Desk will no longer be staffed from 6:30 a.m. to midnight.

That raises the question of if/how the daily read out from the Japan Site Team should be handled. I've copied the LT Coordinator, Danielle and Brian so both the Op Center and Site Team liaisons will be notified in your response of what the decision and possible new procedures will be.

Attached is the combined April 9/10 weekend version of the One-Page Summary.

Gerri

JJJ|313

From:	LIA10 Hoc
Sent:	Monday, April 11, 2011 11:42 AM
To:	LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject:	FW: TEPCO Earthquake Information Update on April 11: Status of Fukushima Daiichi NPS
Attachments:	image004.jpg; image005.jpg; image006.jpg

From: LIA02 Hoc
Sent: Monday, April 11, 2011 11:42 AM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: TEPCO Earthquake Information Update on April 11: Status of Fukushima Daiichi NPS

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Monday, April 11, 2011 11:41 AM
To: LIA02 Hoc
Cc: Aono, Kenjiro; Michael W. Chinworth
Subject: FW: TEPCO Earthquake Information Update on April 11: Status of Fukushima Daiichi NPS

FYI
This is from TEPCO Washington Office.

From: 松尾　建次 [mailto:matsuo.kenji@wash.tepco.com] **On Behalf Of** matsuo.kenji@tepco.co.jp
Sent: Monday, April 11, 2011 11:21 AM
To: matsuo.kenji@tepco.co.jp
Subject: TEPCO Earthquake Information Update on April 11: Status of Fukushima Daiichi NPS

Dear Friends,

Here are updates on Work Progress at Fukushima Daiichi NPS as of 9:00 pm, April 11.

--- There was a aftershock at Hamadori area (close to Fukushima Daiichi and Daini NPS) at 5:16 pm on April 11. Richter scale magnitude was 7.1. All workers in the field evacuated to TSC building in the Fukushima Daiichi site.

JJJ|314

Due to the earthquake, off-site power for units 1, 2 and 3 tripped and water injection to the reactor vessel was stopped temporarily. Then the power supply to the pumps resumed at 6:00 pm.

Though no significant damages were made by the earthquake, radioactive water transfer and nitrogen gas injection were suspended.

Contacts:

TEPCO Washington Office 202-457-0790

Kenji Matsuo, Director and General Manager

Yuichi Nagano, Deputy General Manager,

Masayuki Yamamoto, Manager, Nuclear Power Programs

<Injection of Nitrogen Gas to Primary Containment Vessel of Unit 1>

- Total amount of injected nitrogen was about 3,000 m^3 at 5:00 pm, April 11. Drywell Pressure is 199.0 kPa(abs) at 8:00 pm
- There was an earthquake at 5:16. Epicenter was Hamadori Region (near Fukushima Daiichi and Daini NPS area) and Richter scale magnitude was 7.1. Due to this earthquake, hydrogen injection pumps stopped. We are checking the status of equipment.
- When we started nitrogen injection on April 7, we announced that we would continue injection until about 250 kPa (100 kPa above the original pressure), and it would take 6 days. However, drywell pressure has been stable at about 190-195 kPa. We assume there might be some leakage path from the PCV, and because of the leak, drywell pressure does not increase as planned. Considering hydrogen and oxygen generation by water radiolysis, we determined to continue nitrogen gas injection to PCV.

<Water Injection to the Reactors>

【Unit 1】 Injecting fresh water

Reactor pressure vessel temperature: 4/11 12:00 pm

<Water feed nozzle> 220.8C

<Bottom of reactor pressure vessel> 119.9C

【Unit 2】 Injecting fresh water

Reactor pressure vessel temperature :

4/11 12:00 pm <Water feed nozzle> 154.8C

【Unit 3】 Injecting fresh water

Reactor pressure vessel temperature :

4/11 12:00 pm <Bottom of reactor pressure vessel> 111.0C

【Unit 4】 No particular changes on parameters.

【Units 5/6】 Reactor cold shutdown. No particular changes on parameters.

【Common spent fuel pool】 No particular changes on parameters.

<Water Spray/Injection to Spent Fuel Pools>

- April 11: No spraying conducted.
- April 12(schedule) : Unit 3 16:00～

  Unit 4 11:00～ Sampling spent fuel pool water sampling for analysis

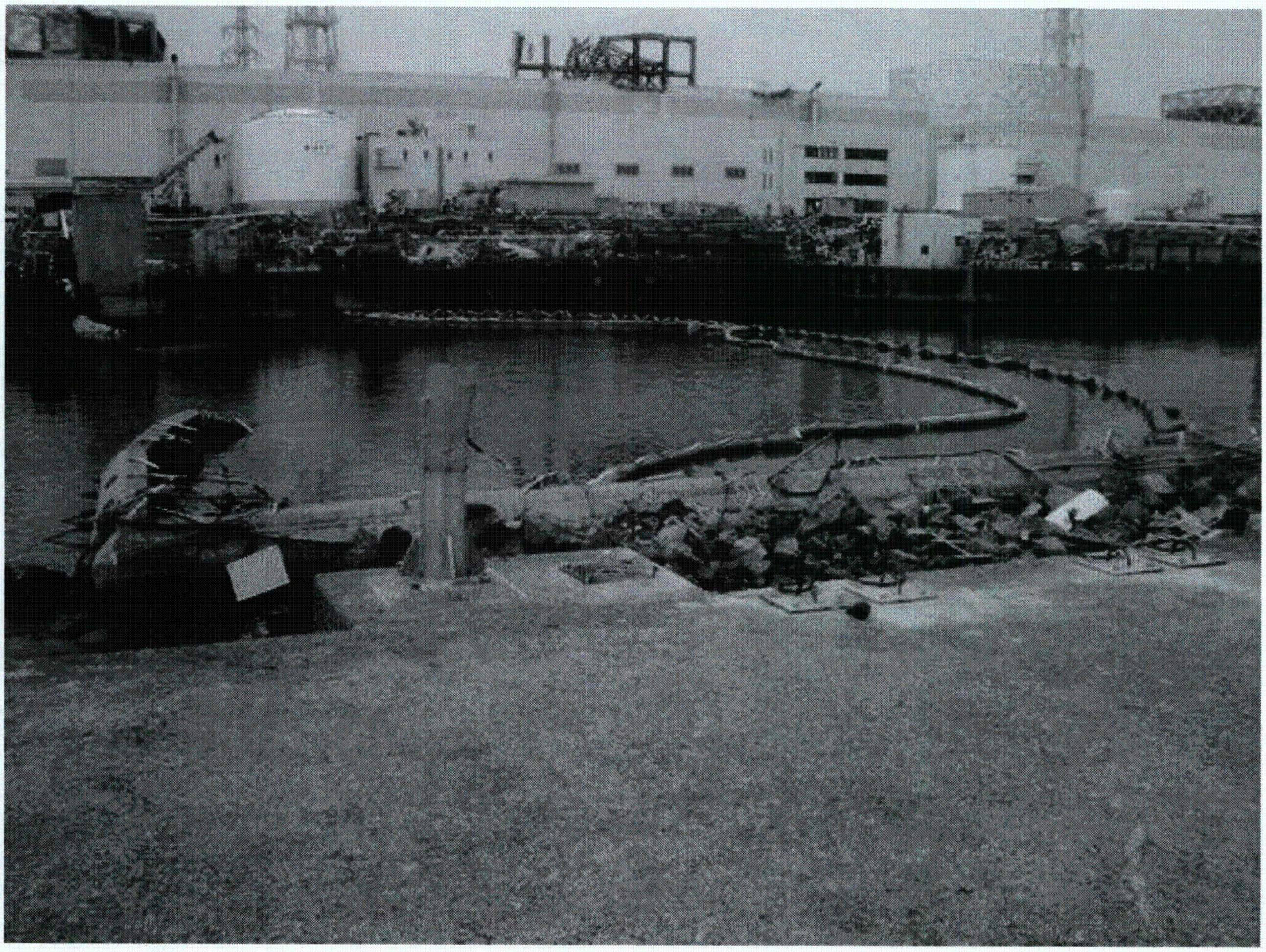
<Draining Water from Underground Floor in Turbine Building>

- Unit 1: Completed transfer from condenser to CST at 9:30 am on April 10.
- Unit 2: Completed transfer from condenser to CST at 1:30 pm on April 9.

  Planning to check for leakage in transfer piping between unit 2 trench to condenser (hotwell).
- Unit 3: Planning to transfer from condenser to CST.
- Preparation work to receive radioactive water in the Central Waste Treatment Facility.
  - ➢ Construction of temporary piping, setting up power supply and installing shields in progress.

<Prevention of Contaminated Water Leakage from Unit2 Trench>

- Completed installment of spillage prevention fences in the south side breakwater. (see picture bellow)
- On April 12, steal plate is scheduled to be installed in front of the screen room at unit 2, spillage prevention fences (Silt Fence) for units 3 and 4 will be installed.



<Discharge of Low level Radioactive Accumulated Water in Central Waste Disposal Facility and Units 5 & 6 to the sea>

【Central Waste Treatment Facility】

- We had discharged approximately 9,070 tons of water (tentative estimation) from the discharge canal of Units 1 to 4 from April 4 to April 10.
- On April 11, we are evaluating the situation after discharge.

【Sub drain of Unit 5 and 6】

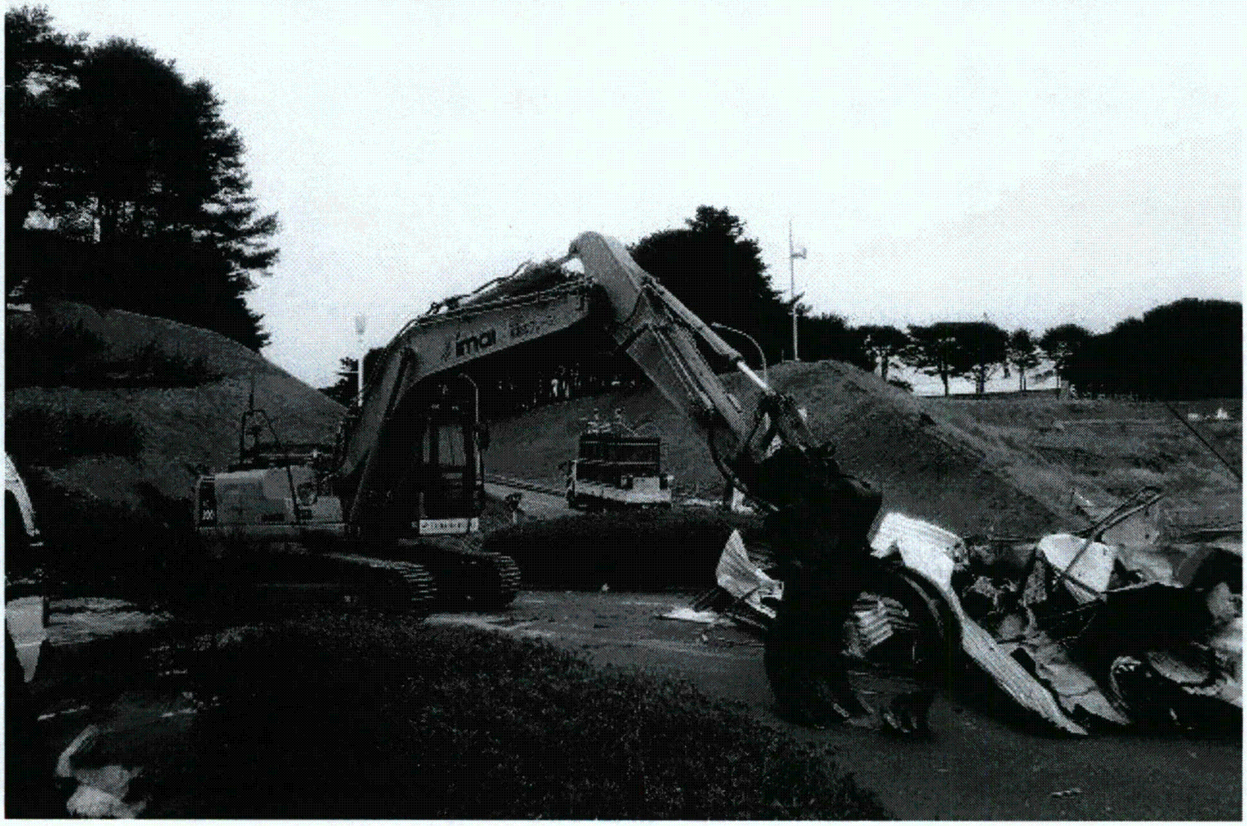
- From April 4th, we started the discharge from the water discharge canal of Units 5 & 6 and at 6:52 pm, April 9, we completed it.

<Spraying of anti-scattering agent>

- April 11: About 1,200m^2 was sprayed on the mountain side of the common spent fuel pool at 12:00 pm – 1:00 pm.
- April 12(schedule): About 500m^2 will be sprayed on the same location.
  - Tentative results of test spraying on April 1 and 5 were as below.
    - April 1: Before spray 1 mSv/h → After 0.8 mSv/h (as of April 3)
    - April 5: Before spray 1.6 mSv/h → After 1.5 mSv/h (as of April 6th)

<Additional Developments>

- Shooting from the air using the unmanned small chopper: 15:59---16:28, April 10
  - Planned flight on April 11 was cancelled due to extra preparation time for setting the devise.
- Rubble removal using remote control robots: 9:00—16:00, April 11.
  - From April 10, two containers (3.2m x 1.6m x 1.1 m) of rubbles were removed.
  - Pictures of robot and operators are shown bellow.


imai


クローラダンプ

From:	LIA10 Hoc
Sent:	Monday, April 11, 2011 10:52 AM
To:	LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject:	FW: Per your request
Attachments:	April 5- April 15 - International Liaison Schedule.doc

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From: LIA03 Hoc
Sent: Monday, April 11, 2011 10:52 AM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: Per your request

From: Kreuter, Jane
Sent: Monday, April 11, 2011 10:52 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: Per your request

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

JJJ|315

International Liaison Coverage for the NRC's Japan Disaster Response

March 24-April 15, 2011

Below you will find the schedule for OIP coverage of the Ops Center. If you cannot work a shift you are scheduled for, it is your responsibility to find a replacement. Once again, thank you for your time, effort and flexibility.

SHIFT 1
SHIFT 6

TUESDAY, APRIL 5

	Staff #1	Staff #2
6:30-3:30	Skip	
3:00-12:00 a	Brian	

WEDNESDAY, APRIL 6

	Staff #1	Staff #2
6:30-3:30	Skip	
3:00p-12:00 a	Lauren	Brian

THURSDAY, APRIL 7

	Staff #1	Staff #2
6:30-3:30	Skip	
3:00p-12:00 a	Steve B.	Brian

SHIFT 7

FRIDAY, APRIL 8

	Staff #1	Staff #2
6:30-3:30	Mugeh	
3:00p-12:00 a	Gerri	Brian

SATURDAY, APRIL 9

	Staff #1	Staff #2
6:30-3:30	Mugeh	Skip
3:00p-12:00 a	Gerri	Brian

SUNDAY, APRIL 10

	Staff #1	Staff #2
6:30-3:30	Elizabeth	Mugeh
3:00p-12:00 a	Gerri	Brian

SHIFT 8

MONDAY, APRIL 11

	Staff #1	Staff #2
6:30-3:30	Steve Bloom	Lance
3:00p-12:00 a	Jenny	Janice

TUESDAY, APRIL 12

	Staff #1	Staff #2
6:30-3:30	Lance	Steve Bloom
3:00p-12:00 a	Jenny	Janice

WEDNESDAY, APRIL 13

	Staff #1	**Staff #2**
6:30-3:30	Lance	Steve Bloom
3:00p-12:00 a	Janice	Jenny

THURSDAY, APRIL 14

	Staff #1	**Staff #2**
6:30-3:30	Steve Baker	
3:00p-12:00 a	Jill	Karen

FRIDAY, APRIL 15

	Staff #1	**Staff #2**
6:30-3:30	Steve Baker	
3:00p-12:00 a	Jill	Karen

From: LIA10 Hoc
Sent: Monday, April 11, 2011 10:36 AM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: Have you returned to the U.S.?

From: LIA02 Hoc
Sent: Monday, April 11, 2011 10:36 AM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Have you returned to the U.S.?

From: Ali, Syed
Sent: Monday, April 11, 2011 10:36 AM
To: LIA02 Hoc; Sheikh, Abdul
Subject: RE: Have you returned to the U.S.?

I returned on April 4, 2011.

Thanks,
Syed Ali

From: LIA02 Hoc
Sent: Saturday, April 09, 2011 10:45 AM
To: Ali, Syed; Sheikh, Abdul
Subject: Have you returned to the U.S.?

Would you please reply to this email to let us know if you have arrived in the U.S. as originally planned on April 7th ?

Thanks,
Mugeh

JJJ|316

From: LIA10 Hoc
Sent: Monday, April 11, 2011 2:29 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: EDO Update
Attachments: ~WRD401.jpg; image006.jpg; image007.jpg; image008.jpg; image009.jpg; image010.jpg

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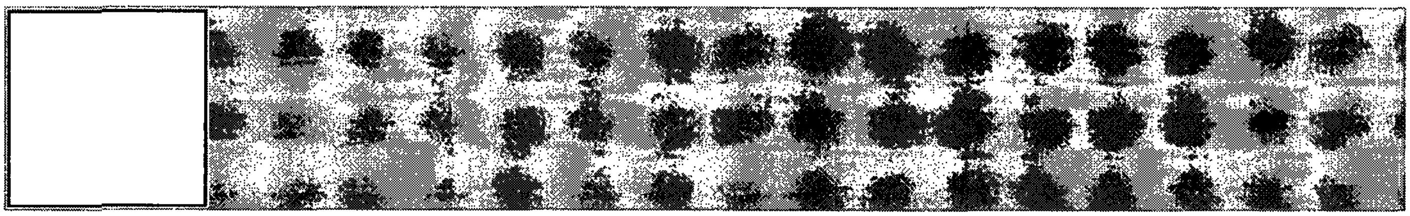
From: LIA02 Hoc
Sent: Monday, April 11, 2011 2:29 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: EDO Update

From: EDO Update [mailto:nrc.announcement@nrc.gov]
Sent: Monday, April 11, 2011 2:27 PM
To: Taylor, Renee
Subject: EDO Update

EDO Update



Monday, April 11, 2011

I am sure that you are all aware that a federal government shutdown was averted on Friday when the leadership of the House and Senate and the President agreed, in principle, to a budget outline for Fiscal Year (FY) 2011 and temporary budget funding until midnight April 14th. Of course, the details have not yet been made public, so we do not know at this point what the final impact of the budget reductions—if any—will be for the NRC. The final outcome should become clearer throughout this week as the Congress develops the appropriations law for FY 2011 before the current Continuing Resolution expires. In the meantime, of course, we will carry on normal operations, including travel and training. As always, I will share any significant new information about the budget as it becomes available.

JJJ|317

On a different topic, it has been more than a month since Northern Japan was struck by the devastating earthquake and tsunami and the resulting nuclear emergency. Although the situation at Fukushima Daiichi nuclear power station has improved, it still requires monitoring and NRC continues to provide assistance to our Japanese counterparts. We will continue to maintain a fully-engaged site team in Japan, but beginning this week we will be increasing the size and adjusting the skill set of the team to effectively support the work activities in Japan. Additional NRC employees are preparing to depart for Japan to replace current staff, allowing them to return home. The headquarters Operations Center, meanwhile, is realigning to better serve the changing needs of stakeholders in other parts of the U.S. Government and the Japanese Government.

Beginning today, the Ops Center will continue to have enhanced staffing around the clock, but will have fewer individuals per shift. Their focus will be coordination and communications, with most technical work associated with the Fukushima response shifting to the line organizations, such as NRR, RES, and NSIR. The line offices will be leveraged to perform the detailed analysis previously performed by the full Reactor Safety, Protective Measures, and Liaison Teams in the Operations (Ops) Center. Taskings to the line organizations will include specific expectations for internal coordination and schedules—with deadlines sometimes measured in hours—to reflect the needs and priorities of the response effort, especially the site team in Japan. I have asked that Office Directors and other supervisors recognize the importance of rapid response, when indicated, and authorize staff overtime as appropriate. This is a pilot approach to help shape our longer-term plans for staffing the Ops Center for this response, and will be re-evaluated at the end of the week.

I continue to encourage you to consult the multiple information resources available on the special section of our public website devoted to events in Japan: http://www.nrc.gov/japan/japan-info.html. Everything in this section, including testimony before Congress, is public information, so you can feel free to share the information from this website with interested friends and family.

Bill Borchardt, EDO

From: LIA10 Hoc
Sent: Monday, April 11, 2011 12:47 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: Type of Passport

From: LIA02 Hoc
Sent: Monday, April 11, 2011 12:47 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Type of Passport

From: Mitman, Jeffrey
Sent: Monday, April 11, 2011 12:47 PM
To: LIA02 Hoc
Subject: RE: Type of Passport

Steve, I have a personal passport.

Jeff Mitman

From: LIA02 Hoc
Sent: Monday, April 11, 2011 12:46 PM
To: Garchow, Steve; Gepford, Heather; Huffert, Anthony; Mitman, Jeffrey; Moore, Carl; Reynolds, Steven
Subject: Type of Passport

Please let me know which type of passport you have, personal or official.

Steve

JJJ|318

From: LIA03 Hoc
Sent: Monday, April 11, 2011 6:54 AM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: Travelers to Japan

From: LIA02 Hoc
Sent: Monday, April 11, 2011 6:54 AM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Travelers to Japan

From: Larson, Emily
Sent: Monday, April 11, 2011 6:54 AM
To: LIA02 Hoc
Subject: Travelers to Japan

Is there a solid number for how many NRC staff will be travelling to Japan this week?

Thanks,

Emily

JJJ|319

From: LIA10 Hoc
Sent: Monday, April 11, 2011 12:24 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: [METI Japan](Apr_11)Update on Seismic and Tsunami Damage Information
Attachments: [METI] Apr 8_0800_Tohoku-Pacific Ocean Earthquake and the Seismic Damages to the NPSs.pdf; Apr_11 Radioactivity Level Map [Chart].pdf

-----Original Message-----
From: LIA02 Hoc
Sent: Monday, April 11, 2011 12:24 PM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: [METI Japan](Apr_11)Update on Seismic and Tsunami Damage Information

-----Original Message-----
From: meti-info@meti.go.jp [mailto:meti-info@meti.go.jp]
Sent: Monday, April 11, 2011 12:13 PM
To: meti-info@meti.go.jp
Subject: [METI Japan](Apr_11)Update on Seismic and Tsunami Damage Information

For your reference, Ministry of Economy, Trade and Industry of Japan (METI) is providing latest information on the seismic and tsunami damages to the nuclear power stations (NPSs) in Japan, including those caused to Fukushima Dai-ichi NPS.

This Monday, the following information has been updated.

---- Today's news ----
We have regular updates as follow.

---- Updates from METI ----
1. [METI] Apr 8_0800_Tohoku-Pacific Ocean Earthquake and the Seismic Damages to the NPSs [Please refer to the attached file]

2. [METI] Apr 11_Radioactivity Level Map Chart [Please refer to the attached file]

---- Updates from NISA ----
3. [NISA] Apr 11 1500_Current Situation of Onagawa, Fukushima Dai-ichi, Fukushima Dai-ni, Tokai Dai-ni NPSs (only Japanese version is now available. English version will be uploaded.)
http://www.meti.go.jp/press/2011/04/20110411007/20110411007-1.pdf

JJJ | 330

[NISA] Apr 8 0800_Current Situation of Onagawa, Fukushima Dai-ichi, Fukushima Dai-ni, Tokai Dai-ni NPSs (English version) http://www.nisa.meti.go.jp/english/files/en20110411-1-1.pdf

4. [NISA] Apr 11 0200_Fukushima Dai-ichi Major Parameters of the Plant (only Japanese version is available. English version will be uploaded.) http://www.meti.go.jp/press/2011/04/20110411003/20110411003-3.pdf

[NISA] Apr 8 0600_Fukushima Dai-ichi Major Parameters of the Plant (English version) http://www.nisa.meti.go.jp/english/files/en20110411-1-3.pdf

---- Major Updates from other agencies of Japanese Government --- 5. [MLIT] Apr 11 PM_Measurement of Radiation Doses in the Ports around Tokyo Bay http://www.mlit.go.jp/kowan/kowan_fr1_000041.html
Currently, the level of radiation in Tokyo City, Yokohama City, Kawaski City and Ichikawa City (Chiba) were as shown in the attachment at very safe level to health.

6. [MLIT] Apr 11 PM_Measurement of radiation doses around the Metropolitan Airports http://www.mlit.go.jp/koku/koku_tk7_000003.html
The current level of radiation does not have any effects on human health.

7. [NSC] Apr 10 1645_Assessment of the result of environment monitoring (only Japanese version is available) http://www.nsc.go.jp/nsc_mnt/110410_1.pdf

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If you need to add other e-mail address to this mailing list or do not need our information mail any more, please contact at meti-info@meti.go.jp

==
International Public Relations Team
Ministry of Economy, Trade and Industry (METI)
1-3-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-8901, Japan E-mail : meti-info@meti.go.jp
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(See attached file: [METI] Apr 8_0800_Tohoku-Pacific Ocean Earthquake and the Seismic Damages to the NPSs.pdf)

(See attached file: Apr_11 Radioactivity Level Map [Chart].pdf)

Tohoku Pacific Earthquake and the seismic damage to the NPSs

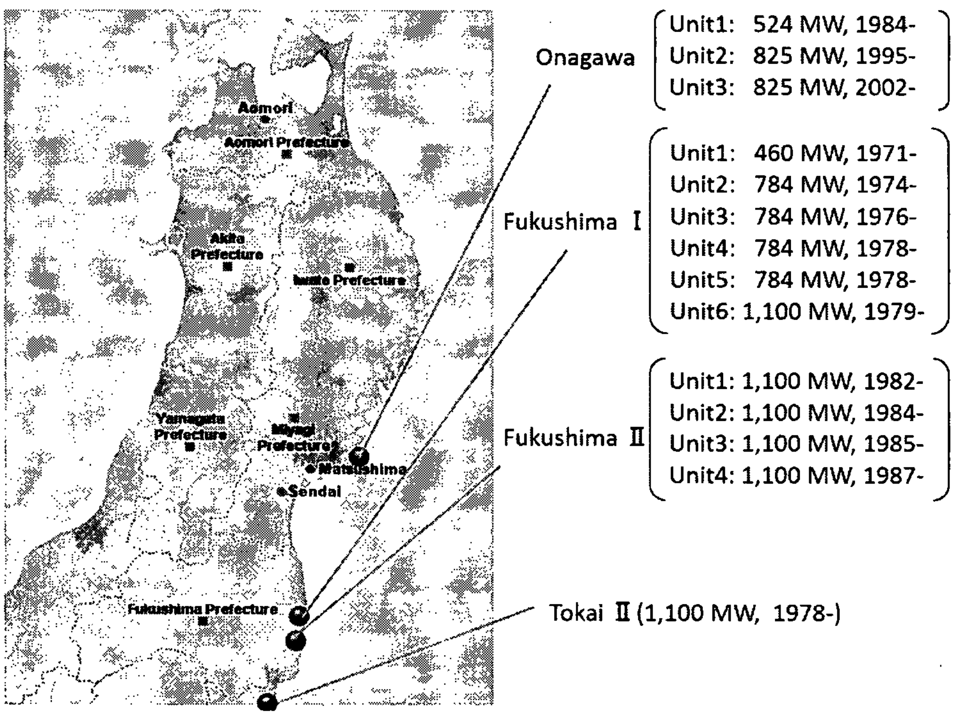
As of 8:00am April 8th, 2011 (JST)
Ministry of Economy, Trade and industry

Earthquake and automatic shut-down of nuclear reactors

The Tohoku Pacific Earthquake of historic magnitude 9.0 struck the northeastern part of Japan at 14:46 on March 11th, 2011.

At the time of the earthquake occurrence, 3 reactors (Units 4, 5 and 6 at Fukushima Dai-ichi (I) Nuclear Power Station (NPS) of Tokyo Electric Power Co. Inc.(TEPCO)) were under periodic inspection outage, and 11 reactors (Units 1, 2 and 3 at Onagawa NPS of Tohoku Electric Power Co. Ltd.; Units 1, 2 and 3 at Fukushima I NPS of TEPCO; Units 1, 2, 3 and 4 of Fukushima Dai-ni (II) NPS of TEPCO; and an unit of Tokai Dai-ni (II) NPS of Japan Atomic Power Co. Ltd.) were automatically shut-down.

After the automatic shut-down, Units 1, 2 and 3 at Onagawa, Unit 3 at Fukushima II, and the Unit at Tokai II have been cold shut down safely. As for the Units 1, 2 and 4 at Fukushima II, TEPCO operator of the station reported the nuclear emergency situation to Nuclear and Industrial Safety Agency (NISA), but afterward the three units have been cold shut down.



Tsunami damaged the cooling systems at the Fukushima Dai-ichi (I)

Since the external power supply was cut off upon the earthquake occurrence at 14:46 on March 11th, the emergency diesel power generators at Fukushima I automatically started generating electricity and the cooling systems began their operation. Then, the massive earthquake triggered the devastating Tsunami wiping away houses, buildings, cars along the widespread areas of the northeast coast.

The emergency diesel power generators and the pumps supplying seawater to the cooling system were halted at 15:41 on March 11th due to the Tsunami estimated more than 10 meters high from the seawater level. Fukushima I lost the AC power sources for Unit 1, 2, 3 and 4 and lost function necessary for cooling down the reactor cores (Unit1,2 and 3) and spent fuel kept in the pools (Unit1,2,3 and 4) inside reactor buildings. Consequently, the pressure and temperature of reactor cores and the water temperature of spent fuel pools went up.

For counter measures, water is being injected into the reactor pressure vessels of Units 1, 2 and 3. At the same time, police, fire brigade and the Self Defense Forces are attempting to pour water into the spent fuel pool of Units 3 and 4 by spraying seawater from helicopters, water cannon trucks and fire engine. Further, TEPCO engineers are working to restore external power supply to Units 1, 2, 3 and 4 (power supply to Units 5 and 6 was completed) by installing the electricity cable connecting to the transmission line of Tohoku Electric Power Co. Ltd. and other transmission route.

Unit 1 Fresh water is being injected to the spent fuel pool and the reactor pressure vessel.

- After the reactor was automatically shut-down and the Tsunami disabled the equipments, the temperature of the reactor core went up and the water level inside the pressure vessel dropped and the reaction of cladding metal of fuel and water generated hydrogen. Vent of the primary containment vessel was operated at 10:17am on March 12th. The hydrogen leaked outside of the containment vessel and caused the explosion at the upper-part of a concrete building housing at 15:36 on March 12th.

- Seawater was being injected into the reactor pressure vessel; thereafter, fresh water is being injected as of 8:00am April 8th, instead of seawater. On March 29th, the pump for the fresh water injection was switched from the fire pump truck to the temporary motor-driven pump.

- On March 31st, spray of fresh water over the spent fuel pool of Unit 1 using the concrete pump truck was carried out. On April 2nd, a test water spray over the spent fuel pool was carried out in order to confirm the appropriate position for water spray.

- Lighting in the main control room was recovered on March 24th. On April 2nd, lighting in the turbine building was partially turned on. And the power supply for the fresh water injection to the reactor pressure vessel was switched to the external power supply on April 3rd.

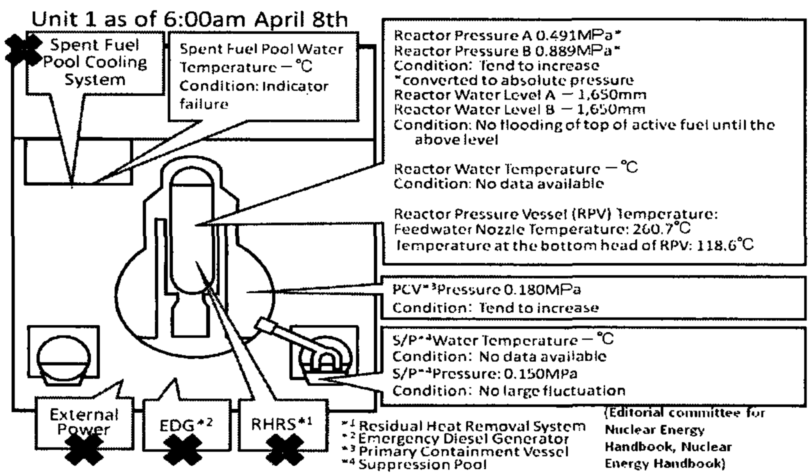
- White smoke was confirmed to generate continuously as of 6:30am April 8th.

- As the result of concentration measurement in the stagnant water on the basement floor of the turbine building, 2.1×10^{5}Bq/cm^{3} of ^{131}I (Iodine) and 1.8×10^{6}Bq/cm^{3} of ^{137}Cs (Caesium) were detected as major radioactive nuclides. Since around 17:00 March 24th, the stagnant water has been transferred to the condenser. As the condenser was confirmed to be almost filled with water, pumping out the water to the condenser was stopped at 7:30am on 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 was 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) Thereafter, the water in the condenser was transferred to the condensate storage tank at 13:55 on April 3rd.

- Aiming at reducing the possibility of hydrogen combustion in the primary containment vessel of Unit 1, the operations for the injection of nitrogen to the vessel were started at 22:30 on April 6th.

- The start of nitrogen injection to the primary containment vessel of Unit 1 was confirmed. (1:31am April 7th)



Unit 2 Fresh water is being injected to the spent fuel pool and the reactor pressure vessel.

- After the automatic shut-down of the reactor, the water injection function was sustained, but the reactor water level tended to decrease. And vent of the primary containment vessel was operated at 11:00am on March 13th and at 0:02am on March 15th.
- At 6:10am on March 15th, TEPCO reported that there was an explosion sound at Unit 2. Given the fact that the pressure in the suppression chamber decreased, it is presumed that there is possibility of certain damage on the suppression chamber.
- Seawater was being injected into the reactor pressure vessel; thereafter, fresh water is being injected as of 8:00am April 8th, instead of seawater. On March 27th, the pump for the fresh water injection was switched from the fire pump truck to the temporary motor-driven pump.
- The seawater injection to the spent fuel pool of Unit 2 using the fire pump truck was switched to the fresh water injection using the temporary motor-driven pump on March 29th. On March 30th, April 1st, 4th and 7th, the injection of fresh water to the spent fuel pool via the spent fuel cooling line were carried out. At 3:00am on April 8th, the temperature in the spent fuel pool was 63.0 degree centigrade.
- The power center of Unit 2 received electricity on Match 20th. On March 26th, lighting of the main control room was recovered. On April 2nd, lighting in the turbine building was partially turned on. And the power supply for the fresh water injection to the reactor pressure vessel was switched to the external power supply on April 3rd.
- White smoke was confirmed to generate continuously as of 6:30am April 8th.
- In order to prepare for transferring the stagnant water on the basement floor of turbine building 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 11:50am April 1st. Thereafter, the water in the condenser was transferred to the condensate storage tank at 17:10 on April 2nd, and 13:55 on April 3rd.
- One more pump for the transfer of the water in the condenser of Unit 2 to the condensate storage tank was installed at 15:40 April on 5th.
- 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. (as of around 9:30 April 2nd) In order to stop the outflow, concrete was started to be poured into the pit. (16:25 and 19:02 April 2nd)
- As the measure to prevent the outflow of the water accumulated in the pits for conduit in the area around the inlet bar screen of Unit 2, the upper part of the power cable trench for power source at the intake channel was crushed and sawdust, high polymer absorbent and cutting-processed newspaper were put inside. (From 13:47 till 14:30 April 3rd)
- 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 at 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 at 15:07 April 5th. The outflow of the water was confirmed to stop at around 5:38am 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)

Unit 3 Fresh water is being injected to the spent fuel pool and the reactor pressure vessel.

- After the automatic shut-down of the reactor, fresh water and subsequently seawater were injected into the reactor pressure vessel through the fire extinguishing system line. And vent of the primary containment vessel was operated at 20:41 on March 12th, at 8:41am on March 13th and at 5:20am on March 14th. However, the pressure in the primary containment vessel rose up unusually and the explosion took place around the reactor building at 11:01am on March 14th.

- On March 16th, 21st and 23rd, the smoke (sometimes whitish, grayish or slightly blackish one) was generated from Unit 3 and died down. As of 6:30am April 8th, white smoke was confirmed to generate continuously.

- For counter measures, seawater was being injected into the reactor pressure vessel, thereafter; fresh water was being injected from March 25th, instead of seawater. On March 28th, the pump for the fresh water injection was switched from the fire pump truck to the temporary motor-driven pump. Fresh water is being injected as of 8:00 April 8th.

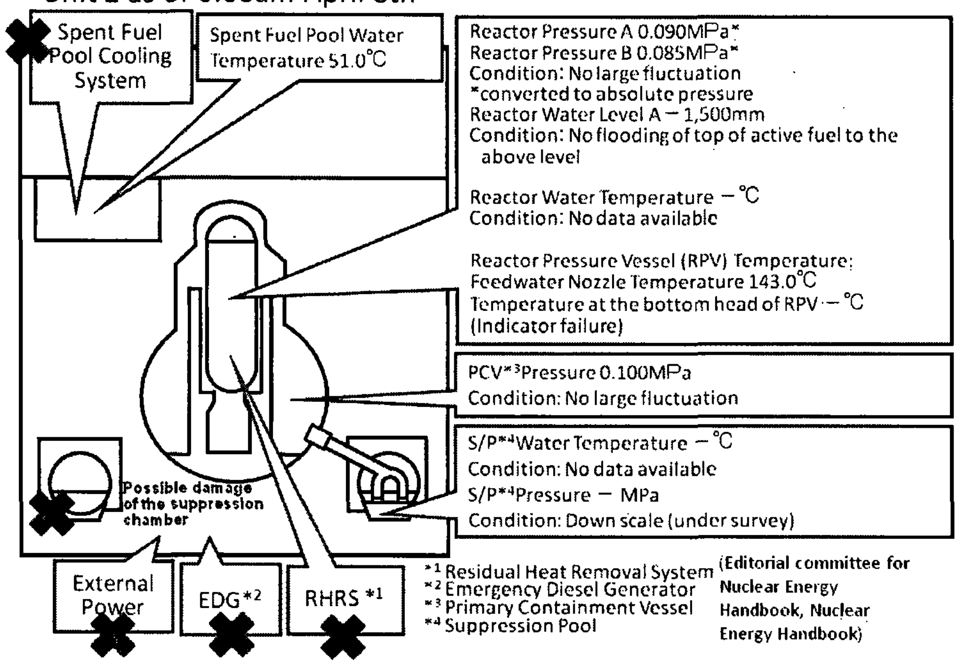
- At the same time, to pour water into the spent fuel pool, helicopters, water cannon trucks, fire engines and concrete pump trucks discharged water to the spent fuel pool of Unit 3 from sky and ground. Injection of seawater to the spent fuel pool via the cooling and purification line was carried out on March 23rd and March 24th. From March 29th till April 7th, fresh water spray over the spent fuel pool using the concrete pump truck had been carried out five times.

- The pressure in the primary containment vessel of Unit 3 rose. (320 kPa as of 11:00 March 20th) Judging from the situation, immediate pressure relief was not required, and monitoring of the pressure continues. (106.1 kPa as of 1:30am April 8th)

- Works for the recovery of external power supply is being carried out. At 22:43 on March 22nd, lighting in the main control room was recovered. On April 2nd, lighting in the turbine building was partially turned on. And the power supply for the fresh water injection to the reactor pressure vessel was switched to the external power supply at 12:18 on April 3rd.

- In order to prepare for transferring 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 till around 8:40am March 31st.

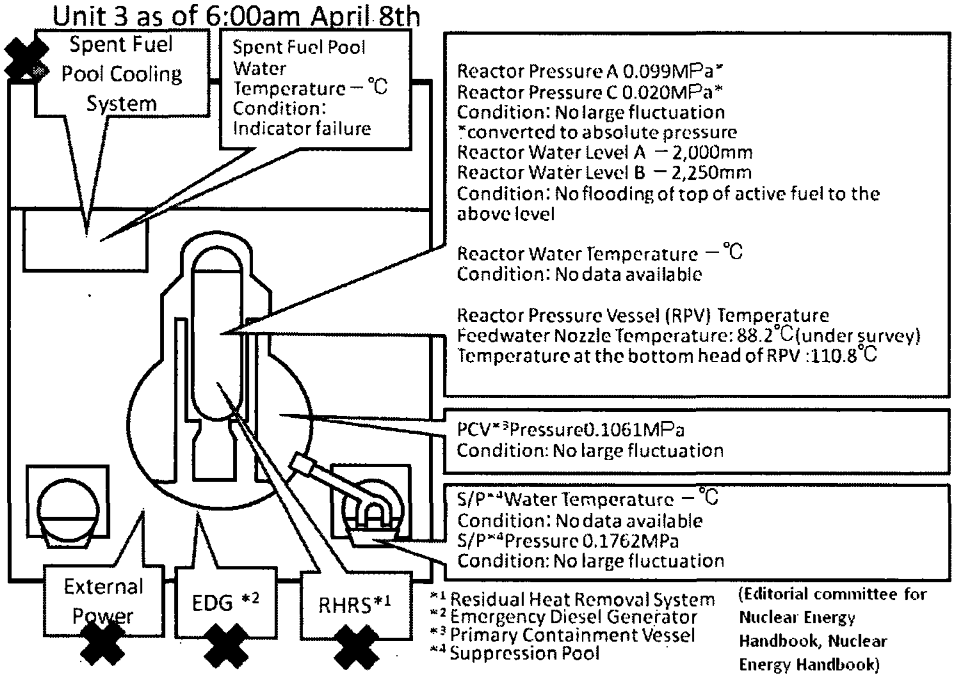
Unit 2 as of 6:00am April 8th



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

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

Unit 3 as of 6:00am April 8th



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

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

Unit 4 No fuel is in the reactor pressure vessel. Fresh water is being injected to the spent fuel pool.

- There is no fuel in the reactor pressure vessel due to replacement work of the shroud.

- The temperature of water in the spent fuel pool went up. At 4:08am on March 14th, the temperature in the spent fuel pool of Unit 4 was 84 degree centigrade.

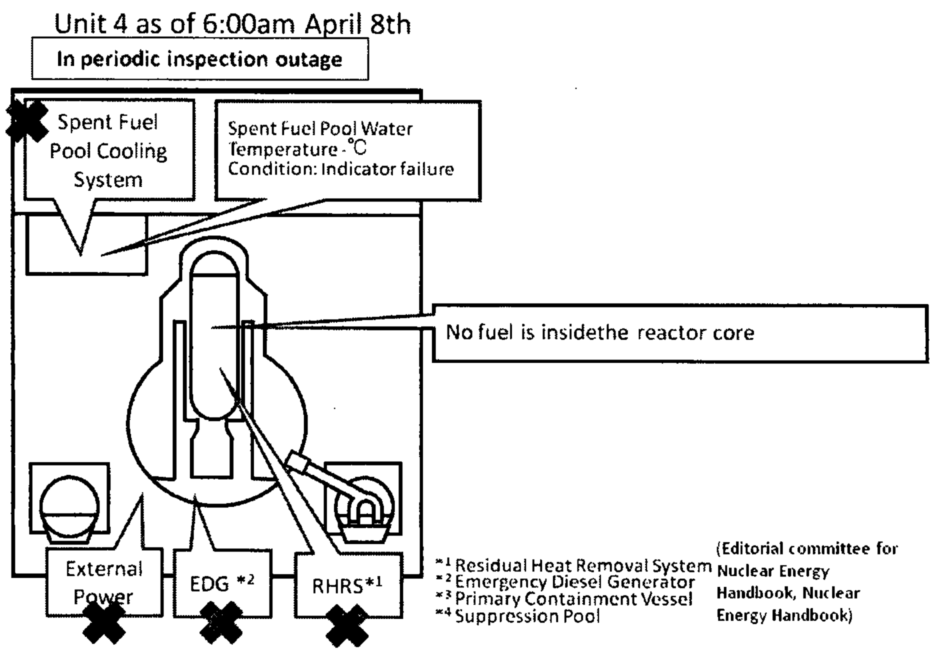
- It was confirmed that a part of wall of the operation floor of the reactor building of Unit 4 was damaged at 6:14am on March 15th. A fire took place at Unit 4 at 9:38am, but the fire was extinguished spontaneously as of 11:00am. And at 5:45am on March 16th, it was reported that a fire occurred at Unit 4; however, no fire was confirmed by TEPCO staff on the ground at 6:15am.

- White smoke was confirmed to generate continuously as of 6:30am April 8th.

- Water spray over the spent fuel pool of Unit 4 by Self-Defense Force was carried out three times from March 20th till March 21st. And water spray using a concrete pump truck had been carried out five times with seawater from March 22nd till March 27th and five times with fresh water from March 30th till April 7th. Injection of seawater to the spent fuel pool via the fuel pool cooling line was carried out on March 25th.

- The power center received electricity on March 22nd. On March 29th, lighting in the main control room was recovered. On April 2nd, lighting in the turbine building was partially turned on.

- From April 2nd, 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.(9:22am April 4th)



Unit 5&6 Unit 5 & 6 is under cold shut down.

- The emergency generator (B) for Unit 6 was operating and supplying electricity to Unit 5 and Unit 6. Fresh water was being injected into the reactor pressure vessels and the spent fuel pools by make-up water condensate system.

- The pump for residual heat removal system (RHR) (C) for Unit 5 and RHR (B) for Unit 6 started up on March 19th and recovered heat removal function. (power supply: emergency diesel generators for Unit 6)

- Unit 5 was under cold shut down at 14:30 and Unit 6 was under cold shut down at 19:27 on March 20th.

- Unit 5 and Unit 6 received electricity reached to the starting transformer on March 20th. The power supply of Unit 5 and Unit 6 was switched from the emergency diesel generator to the external power supply on March 21st and March 22nd.

- The temporary pump of RHR seawater system (RHRS) for Unit 5 was automatically stopped at 17:24 on March 23rd when the power supply was switched from the temporary to the permanent. Thereafter, repair of the temporary pump of RHRS was completed at 16:14 and cooling was started again at 16:35 on March 24th.

- Power supply for the temporary pumps for RHRS of Unit 6 was switched from the temporary to the permanent at 15:38 and 15:42 on March 25th.

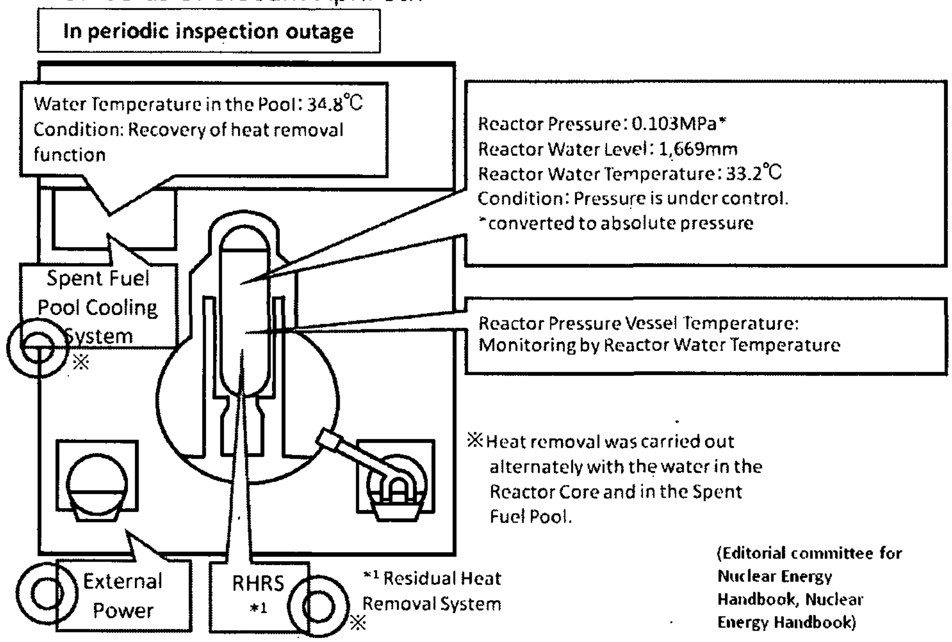
- The temperature of water in the spent fuel pool of Unit 5 and Unit 6 were 34.8 degree centigrade and 28.0 degree centigrade, respectively as of 6:00am April 8th.

- The groundwater with low-level radioactivity in the sub drain pits of Units 5 and 6 (around 1,500t) was started to be discharged through the water discharge canal to the sea at 21:00 April 4th.

Common Spent Fuel Pool

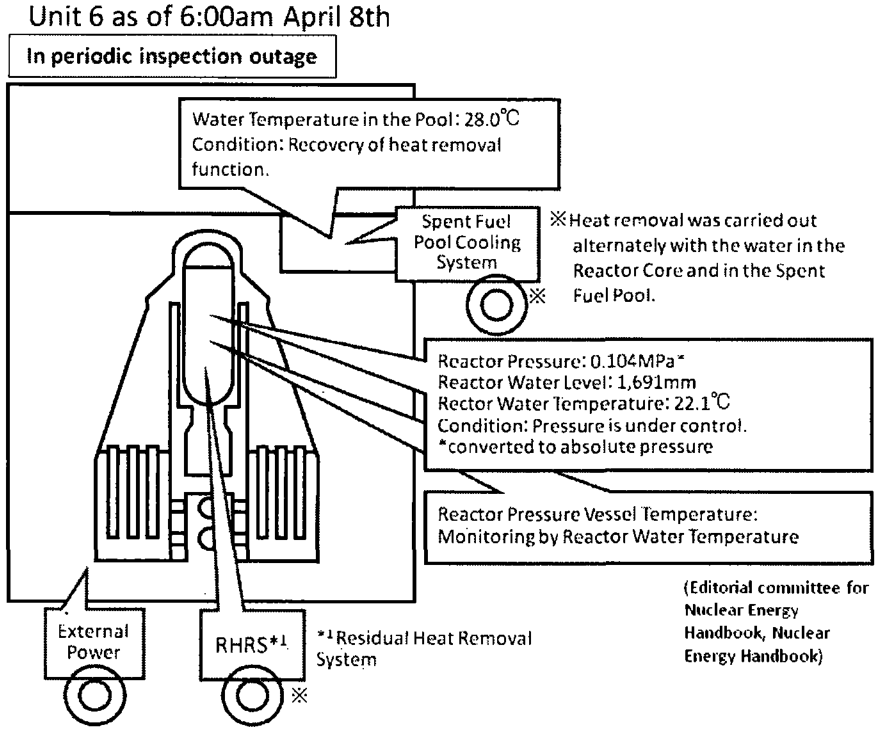
- The power supply was started at 15:37 and cooling was also started at 18:05 on March 24th. As of 7:45am April 7th, the water temperature of the pool was around 28 degree centigrade.

Unit 5 as of 6:00am April 8th



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

Unit 6 as of 6:00am April 8th



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

Other

- As the result of nuclide analysis at around the southern water discharge canal, 7.4×10^{1}Bq/cm^3 of ^{131}I (1850.5 times higher than the limit of concentration of water outside the Environmental Monitoring Aria) was detected as of 14:30 March 26th. (As the result of measurement on March 29th, it was detected as 3355.0 times higher than the limit in water.)

- As the result of the analysis at the northern water discharge canal, 4.6×10^{1}Bq/ cm^3 of ^{131}I (1262.5 times higher than the limit) was detected as of 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 water of the Unit 1's 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 9:20am till 11:25 March 31st)

- In the samples of soil collected on March 21st and 22nd on the site (at 5 points) of Fukushima I, 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.

- 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}Pu (Plutonium), ^{239}Pu (Plutonium) and ^{240}Pu (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.

- 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.

- 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 Japan Maritime Self-Defense Force. (15:42 March 31st) The transfer of fresh water from the barge 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 carried out from 10:20am till 16:40 April 2nd.

- 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 Japan Maritime Self-Defense Force. (9:10am April 2nd)

- The spraying for test scattering of anti-scattering 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 freshwater was transferred from the barge (the second ship) of the US armed force to the other 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 (Around 10,000t) was started to be discharged from the southern side of the water discharge canal to the sea, using the first pump at 19:03 April 4th. Further, at 19:07 on the same day, the discharge using 10 pumps in total was carried out.

- 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)

Current Situation

- Evacuation as far as 20 kilometers from Fukushima I NPS and 10 kilometers from Fukushima II NPS was almost completed (see the diagram "Fukushima prefecture"). The residents in the areas from 20 kilometers to 30 kilometers radius from Fukushima I NPS are directed to stay in-house.

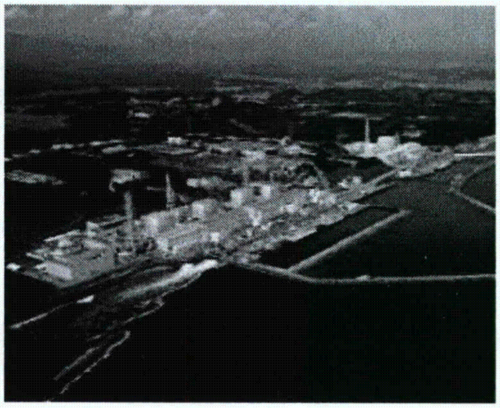
- On March 16th, the Local Emergency Response Headquarter issued "the direction to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefecture Governors and the heads of cities, towns and villages.

Monitoring Data

1) The data of Monitoring Post out of 20 kilometers zone of Fukushima I NPS is available on the following website:
http://www.mext.go.jp/a_menu/saigaijohou/syousai/1303726.htm

2) The real-time radiation data collected via the System for Prediction of Environment Emergency Dose Information (SPEEDI) is available on the following website:
http://www.bousai.ne.jp/eng/

Outline of the Fukushima I Nuclear Power Station



(Fukushima Dai-ichi nuclear power station)

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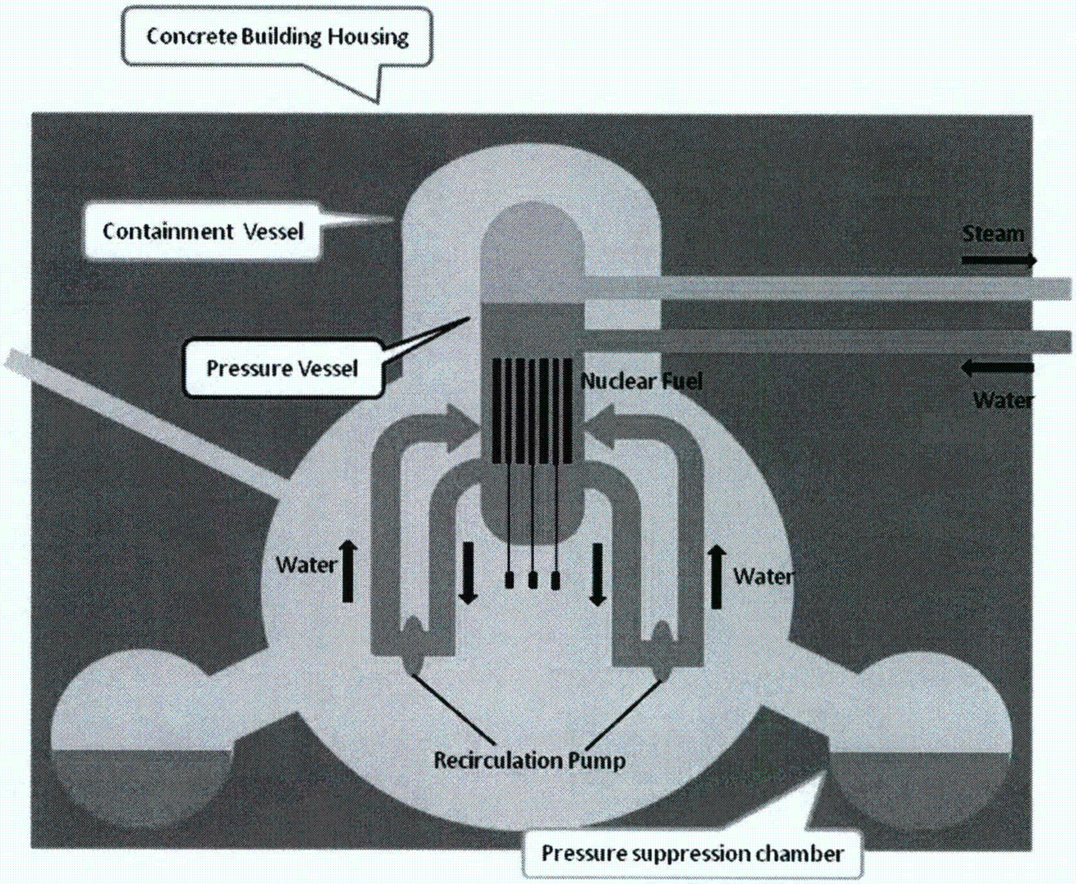
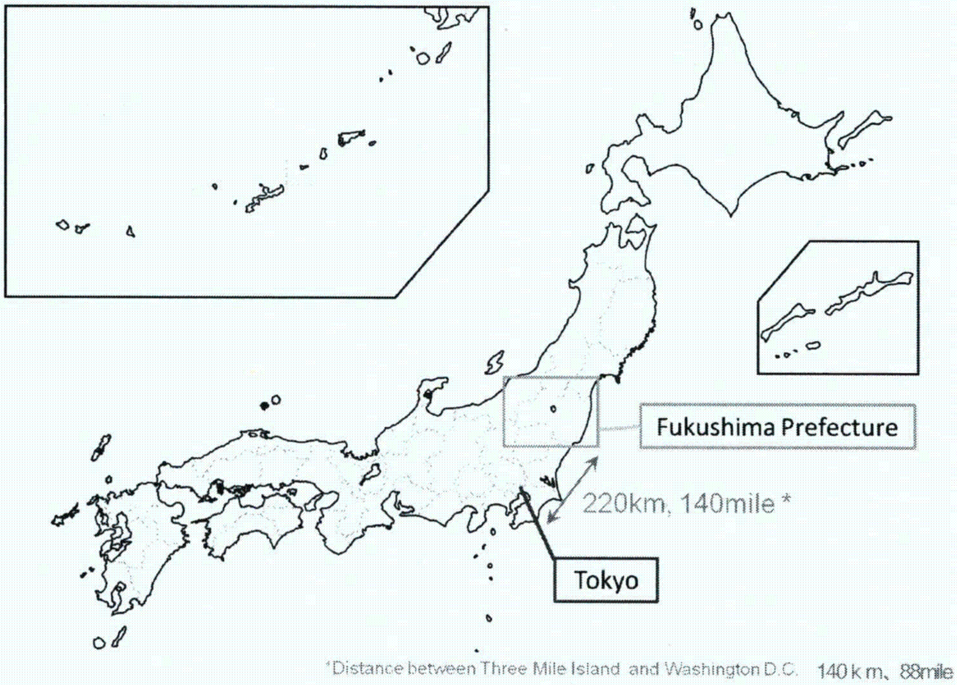
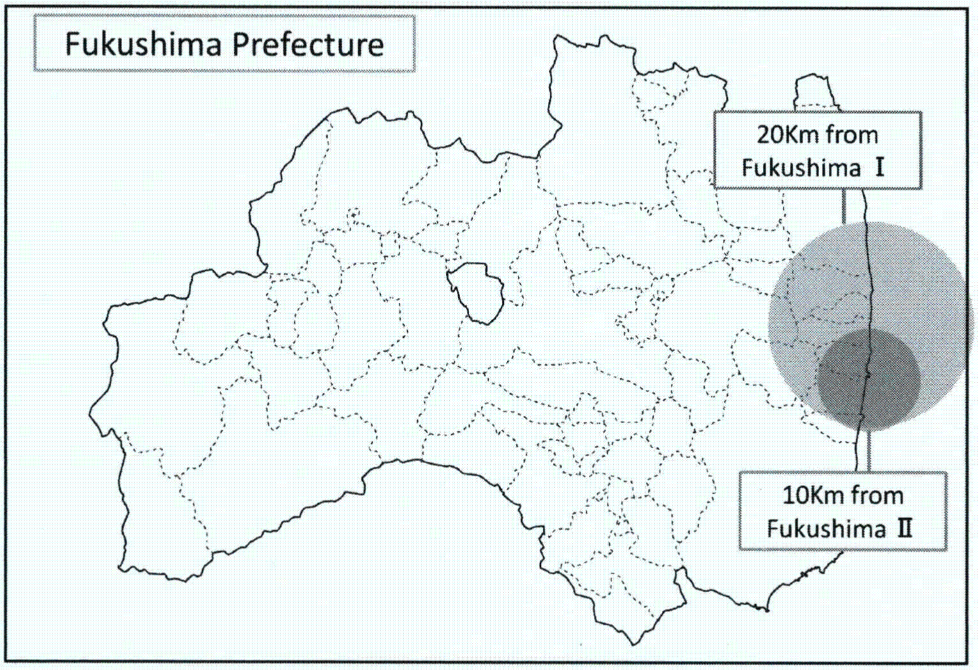


(Structure of BWR)

Location of Fukushima I and II in Japan





Appendix D to Part 835--SURFACE CONTAMINATION VALUES

The data presented in appendix D are to be used in identifying and posting contamination and high contamination areas in accordance with § 835.603(e) and (f) and identifying the need for surface contamination monitoring and control in accordance with § 835.1101 and 1102.

Surface Contamination Values[1] in dpm/100 cm^2

Radionuclide	Removable [2,4]	Total (Fixed + Removable)[2,3]
U-nat, U-235, U-238, and associated decay products	[7] 1,000	[7] 5,000
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	20	500
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200	1,000
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above[5]	1,000	5,000
Tritium and tritiated compounds[6]	10,000	N/A

[1] The values in this appendix, with the exception noted in footnote 5 below, apply to radioactive contamination deposited on, but not incorporated into the interior or matrix of, the contaminated item. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides apply independently.
[2] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
[3] The levels may be averaged over one square meter provided the maximum surface activity in any area of 100 cm^2 is less than three times the value specified. For purposes of averaging, any square meter of surface shall be considered to be above the surface contamination value if: (1) from measurements of a representative number of sections it is determined that the average contamination level exceeds the applicable value; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds three times the applicable value.

	actor pressure (gauge pressu		Reactor water level		)/W Pressur	S/C Pressur	CA
	A system	B system	Fuel region A	Fuel region B	Absolute pressure		D/W
	MPag	MPag	mm	mm	kPa	kPa	Sv/h
3/12/2011 6:00	7.25						
3/12/2011 6:10			200	0	310		
3/12/2011 6:30	7.49		350	50	320		
3/12/2011 6:47							
3/12/2011 7:30	7.23		380	50	340		
3/12/2011 7:40							
3/12/2011 7:55							
3/12/2011 8:30			400	60	350		
3/12/2011 8:36							
3/12/2011 8:49							
3/12/2011 9:00	7.46		400	60	360		
3/12/2011 9:10							
3/12/2011 9:15							
3/12/2011 9:30	7.36		350	70	350		
3/12/2011 10:04							
3/12/2011 10:40							
3/12/2011 11:20			200	70	360	750	
3/12/2011 11:30							
3/12/2011 12:05							
3/12/2011 12:10	7.53		560	90	390	800	
3/12/2011 12:35							
3/12/2011 12:45	5.6		450	90	380	800	
3/12/2011 12:55							
3/12/2011 13:38	4.0		0	0	360	800	
3/12/2011 13:58	3.63		420		360	850	
3/12/2011 14:10							
3/12/2011 14:50							
3/12/2011 15:14							
3/12/2011 15:28							
3/12/2011 17:00	2.9		400		300		
3/21/2011 18:30	1.35		1,200		280		
3/12/2011 19:00	0.95		1,050		285		
3/12/2011 20:08							
3/12/2011 20:15	0.8		1,450		270		
3/12/2011 20:31			1,350				
3/12/2011 22:00	0.97				170		
3/12/2011 23:35	0.8		1,450		170		
3/13/2011 0:00	0.97				270		
3/13/2011 1:00	0.97						
3/13/2011 2:00	0.85						
3/13/2011 3:00							
3/13/2011 3:38	4.10						
3/13/2011 4:00							
3/13/2011 5:00	7.38		-2,000	-3,500	360		

3/13/2011 5:30	7.27		−2,400	−3,500	355		
3/13/2011 6:50	7.35		−2,850	−3,400	440		
3/13/2011 7:00							
3/13/2011 8:00	7.27		−3,000	−3,300	465	445	
3/13/2011 8:55							
3/13/2011 9:10	0.46		1,800	0	637	590	
3/13/2011 9:25	0.35		1,000	1,300			
3/13/2011 9:55							
3/13/2011 10:35			−200	−700	280	230	
3/13/2011 11:55	0.12		1,000	1,000	−	−	
3/13/2011 12:40	0.45						
3/13/2011 13:00	0.19		−1,400	−2,000	900	250	
3/13/2011 14:10							
3/13/2011 14:30							
3/13/2011 15:00			−1,600	−2,000	260	210	
3/13/2011 16:00	0.18		−1,500	−2,000	350	300	
3/13/2011 17:30	0.24		−1,800	−2,100	415	365	
3/13/2011 18:45	0.25		−1,800	−2,200	420	375	
3/13/2011 19:00	0.25		−1,800	−2,200	425	375	
3/13/2011 19:30							
3/13/2011 19:55	0.25		−1,800	−2,200	425	375	
3/13/2011 21:00							
3/13/2011 21:30							
3/13/2011 21:40			−1,800	−2,200	320	320	
3/13/2011 22:30							
3/13/2011 22:45							
3/13/2011 23:00	0.089	0.087	−1,800	−2,250	265	275	
3/13/2011 23:30	0.066	0.068	−1,800	−2,250	250	260	
3/14/2011 0:00							
3/14/2011 0:30	0.051	0.051	−1,800	−2,250	240	255	
3/14/2011 2:00	0.077	0.079	−1,800	−2,250	265	275	
3/14/2011 3:00	0.134	0.134	−1,850	−2,300	315	305	
3/14/2011 4:00	0.159	0.159	−1,850	−2,800	340	325	
3/14/2011 4:30							
3/14/2011 4:45							
3/14/2011 5:00	0.181	0.181	−2,000		365	345	1.58E+02
3/14/2011 5:30							
3/14/2011 6:00	0.181	0.181	−2,350		425	400	1.66E+02
3/14/2011 6:30							
3/14/2011 7:00	0.338	0.334	O.S.	−3,000	520	500	
3/14/2011 7:30							1.67E+02
3/14/2011 8:00	0.310	0.320	−1,000	650	500	480	1.60E+02
3/14/2011 9:00							
3/14/2011 9:05	0.304	0.308	−1,500	2,800	490	475	1.57E+02
3/14/2011 9:45							
3/14/2011 10:05	0.327	0.332	−1,500	800	510	495	1.54E+02
3/14/2011 10:30							

3/14/2011 11:15	0.206	0.215	−1,600	O.S.	380	390	
3/14/2011 11:30	0.180	0.190	−1,800	O.S.	360	360	
3/14/2011 11:55	0.183	0.191	−1,800	−2,200	360	380	

MS
S/C Sv/h

3.78E+00
3.77E+00
4.00E+00
4.40E+00
4.50E+00
4.40E+00

Regarding Review of Units 1 ~ 3 Cooling Methods (draft)

March 23, 2011
Joint Response Team

1. Introduction

With regard to Units 1 ~ 3, cooling effects are maintained by continuous sea water injection by fire extinguishing pumps. But it the water level is elevated to the containment vessel dry vent and vent openings are blocked, external water injection becomes impossible. According to the plant manufacturer, that threshold is expected to be reached earliest at Unit 2 and Unit 3 around March 25.

Also, there is concern that decomposition of water by radiation may be accelerated due to core damage and induce hydrogen explosion at both containment vessel and pressure vessel, so special attention is needed.

Because of this, it is necessary to expeditiously review alternative cooling methods, implement necessary measures and transition the units to cold shut down status, while employing the basic cooling method of utilizing existing sea water pumps and residual heat removal system through restoration of power supply.

2. Basic Policy

(1) Manage the water level and implement cooling by external water injection to the extent that the containment vessel vent does not get blocked.
(2) Quickly switch sea water injection to fresh water injection.
(3) Always pay attention to hydrogen explosion risk. As part of the effort, replace the ambience inside the containment vessel with nitrogen that does not cause hydrogen explosions.
(4) Stop water injection before the water level becomes higher than the containment vessel vent and conduct cooling by latent heat through boiling. Release the steam from the vent opening and implement an interim "Feed and Breed" method to supply water to supplement the vaporized water.
(5) Review cooling of the upper part of the containment vessel by water supply and cooling by the ventilation and air condition system as additional alternative cooling methods.
(6) install internal circulation pipes using existing piping and implement cooling by alternative heat sink until RHR is restored.
(7) In work planning, take reduction of radiation in the environment, reduction of exposure dose of employees and work efficiency into consideration.

3. Preparation Works

3.1 Formulation of outline plan

Clarify the entire process up to cold shut down and decide on the deadline of individual processes and people in charge of those processes.

Process	~ March 26	~ End of March	~ End of April	After April
Formulation of Plan	(see the original- translator)			
Continuation of External Water Injection				
Water Level Monitoring Switch to Feed and Breed				
Sea Water Injection				
Switching to Fresh Water				
Arrangement of Nitrogen equipment (?)				
Replacement with Nitrogen				
Procurement of Materials				
Various Reviews				
C/V anti-shock pressure durability				
reactor water radiation intensity				
review of alternative cooling methods				
Radiation intensity map				
Restoration of RHR, sea water pumps				

3.2 Procurement of Materials

Based on the premise that RHR cannot be used, formulate materials procurement plan for alternative cooling.
(1) Clarification of specifications of nitrogen tanker lorry with vaporizer and procurement of it (TEPCO/NISA)
(2) 3 sea water pumps for temporary installation (TEPCO)
(3) Alternative cooling pipes (TEPCO)
(4) Heat converter (TEPCO)
(5) Protective measures against radiation such as primary shielding

3.3. Matters for Review
(1) Anti-shock pressure durability of the containment vessel (plant manufacturer)
(2) preparation of procedure manual on countermeasures against hydrogen explosion (plant manufacturer)
(3) Evaluation of radiation intensity of the containment vessel and reactor water
(4) Creation of mapping of radiation intensity inside reactor buildings

4. Notamdum (dos and don'ts)

4.1. Avoidance of Hydrogen Explosion Risk
There was scram of the reactor core, but water decomposition accelerated due to the core damage. According to the analysis results, hydrogen in the amount of 1200 kg/h at Unit 1and 1700 kg/h at Units 2 and 3 is generated as an estimate at present. Through segregation of oxygen in sea water, the current status of content inside the containment vessel may be composed of three layers of hydrogen, oxygen and water vapor. Because of this, partial pressure of water vapor gets high during high temperature and risk of hydrogen explosion gets lower. But when partial pressure of water vapor gets lower, risk of hydrogen explosion gets higher.
At present, the temperature of the lower part of the containment vessel of Unit 1 is 300°C. If venting is implemented without care under this condition, there is concern that this may cause an explosion so caution is needed.
As described above, since the percentage of hydrogen and oxygen in the containment vessel is high, it is necessary to replace them with nitrogen that is used as an inert gas. In any case, it is essential to prepare a hydrogen explosion countermeasures procedure manual in advance and let people concerned know this.

(1) Combustion in suppression chamber
It requires caution because there is risk of hydrogen combustion inside the suppression chamber. Even if hydrogen combustion occurs and the suppression chamber gets damaged, pool scrubbing in the reactor building can be hoped for.

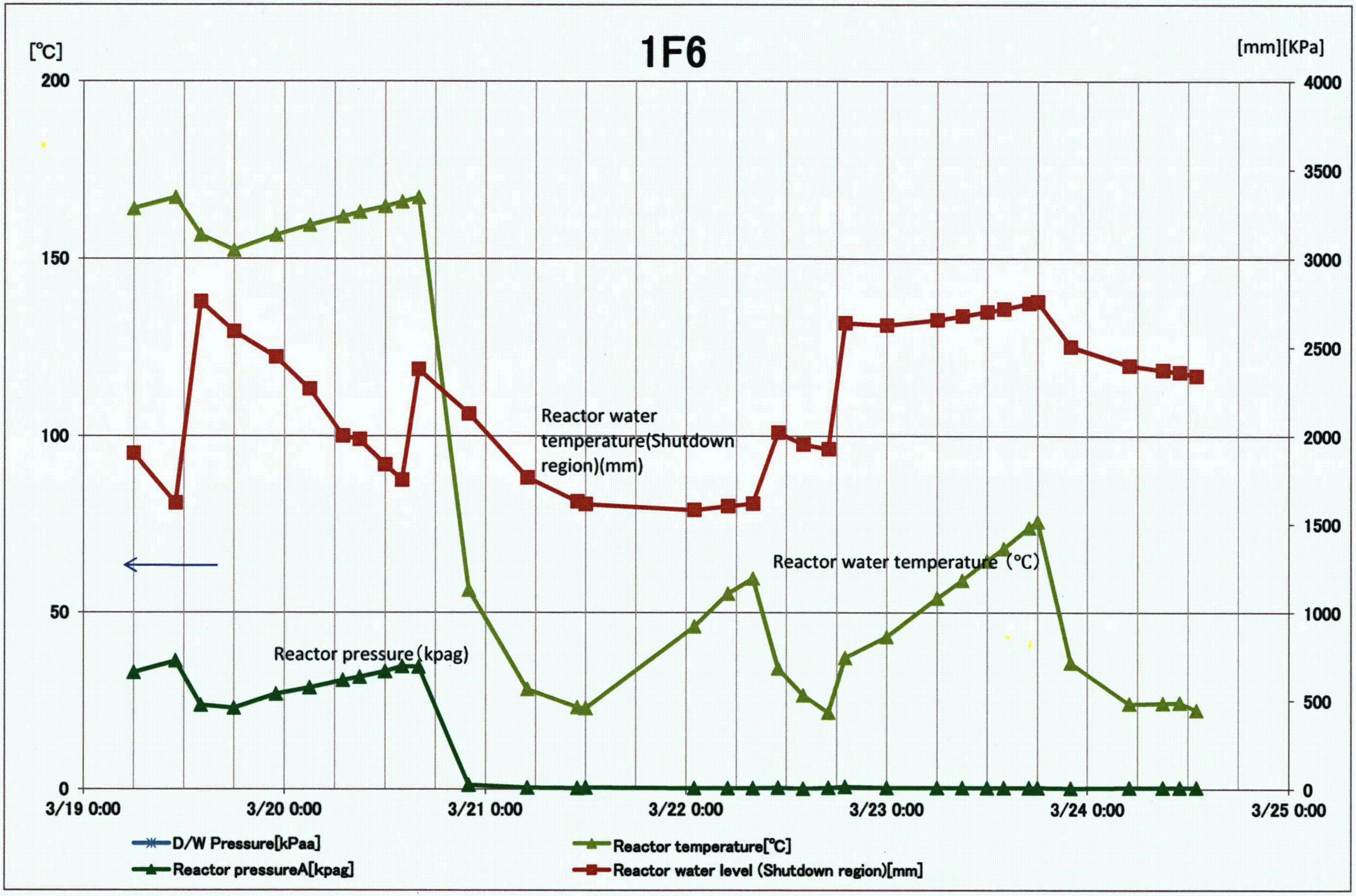
(2) Combustion in dry well
Since dry well venting is implemented, this is expected to avert combustion but caution is necessary. However, cooling of the ambience from the top by the containment vessel spray can cause increase of oxygen concentration and combustion risk gets higher, so such cooling method should be avoided. (If water vapor concentration becomes 55% or lower, there is combustion risk.)

(3) Combustion inside the building
Since the side wall of the building remains open, risk is considered to be low but caution is necessary.

4.2. Risk of Water Vapor Explosion
Just like TMI accident, in case the melt pool is maintained inside the pressure vessel, this may possibly flow down into sea water inside dry well and cause hydrogen explosion.
Nevertheless, there are many structures including control rod drive and internal pipes of reactor in the lower panel of the pressure vessel, so the melted fuel is expected to flow down slowly or in dispersed manner and risk of hydrogen explosion is considered to be low.

4.3. Risk of Impediment to Cooling Due to Salt Precipitation
As the result of increase of salt concentration due to boiling, if salt gets precipitated and precipitation gets accumulated in the lower part of the core, this will impede cooling.
Considering the past cooling operation, more than enough water to cancel out decay heat is injected so concentration inside the reactor is considered to be low. But caution is necessary on this point.

4.4. Regarding the Impact of Venting Operation on the Surrounding
In the analytical case in which all the alternating electric power supply is lost and radioactive materials get released, the dose rate is about 34 mSv/hr on the boundary of the site and about 3 mSv/hr at the location 8.5 km in distance from the site.
Comparing to the current accident, nine days have transpired after the accident and as the result the nuclides with short half life have rapidly decreased. Also, release from the pressure control room is continuing intermittently, and most of volatile radioactive materials have been released.
In current situation, even if there is release from the containment vessel, the reading is expected to be about 3.4 mSv/hr on the site boundary and about 0.3 mSv/hr at the location 8.8 km away which is less than one tenth of the above figure.
The above calculation is based on the maximum value among 16 directions. So in case of venting with managed release, almost no impact is expected in some directions depending on the wind direction. (Especially in case of long distance away)


1F6
[℃]
[mm][KPa]
200
150
100
50
0
4000
3500
3000
2500
2000
1500
1000
500
0
3/19 0:00
3/20 0:00
3/21 0:00
3/22 0:00
3/23 0:00
3/24 0:00
3/25 0:00
Reactor water temperature(Shutdown region)(mm)
Reactor water temperature (℃)
Reactor pressure (kpag)
D/W Pressure[kPaa]
Reactor pressureA[kpag]
Reactor temperature[℃]
Reactor water level (Shutdown region)[mm]

F6

Date	Time	Reactor water level (Shutdown region)[mm]	Reactor temperature[°C]	Reactor pressure A[kpag]	Reactor pressure B[kpag]	D/W Press [kPa	S/C	CAMS(	CAMS(S	
3月14日	0:30									
3月14日	2:00									
3月14日	3:00									
3月14日	4:00									
3月14日	4:40									
3月14日	5:00									
3月14日	6:00									
3月14日	7:00									
3月14日	8:00									
3月14日	9:00									
3月14日	11:15									
3月14日	11:25									
3月14日	11:30									
3月14日	12:00									
3月14日	13:00									
3月14日	14:00									
3月14日	15:00									
3月14日	16:00									
3月14日	17:00									
3月14日	18:30									
3月14日	19:00									
3月14日	20:03									
3月14日	21:04									
3月14日	22:40									
3月14日	23:00									
3月15日	0:00									
3月15日	1:00									
3月15日	2:00									
3月15日	3:00									
3月15日	6:28									
3月15日	11:25									
3月15日	11:42									
3月15日	11:58									
3月15日	13:00									
3月15日	15:25									
3月15日	18:43									
3月16日	1:35									
3月16日	1:54									
3月16日	5:35									
3月16日	6:55									
3月16日	12:25									
3月16日	23:50									
3月17日	3:10									
3月17日	11:30									
3月17日	12:50									
3月17日	21:50									
3月18日	2:50									
3月18日	7:55									
3月18日	16:00									
3月18日	20:55									
3月18日	21:00									
3月19日	3:30									
3月19日	6:00	1902	164.1	659						
3月19日	11:00	1620	167.2	724						
3月19日	14:00	2758	156 6	474						
3月19日	18:00	2590	152 4	458						
3月19日	23:00	2446	156.6	537						
3月20日	3:00	2265	159.4	573						
3月20日	7:00	2000	161.8	615						
3月20日	9:00	1981	163.1	633						
3月20日	12:00	1838	164.7	664						
3月20日	14:00	1750	166	693						
3月20日	16:00	2376	167.2	690						
3月20日	22:00	2125	56.3	23						
3月21日	5:00	1764	28.2	8						
3月21日	11:00	1629	23.1	5						
3月21日	12:00	1613	22.8	8						
3月22日	1:00	1580	46	5						
3月22日	5:00	1602	55.3	5						
3月22日	8:00	1616	59.6	5						
3月22日	11:00	2019	34.1	8						
3月22日	14:00	1952	26.5	3						
3月22日	17:00	1926	21.6	8						
3月22日	19:00	2637	37.1	13						
3月23日	0:00	2625	43.1	8						
3月23日	6:00	2655	54	8						
3月23日	9:00	2677	59.1	8						
3月23日	12:00	2701	64.6	8						
3月23日	14:00	2717	68.1	8						
3月23日	17:00	2748	74	8						
3月23日	18:00	2758	75.7	8						
3月23日	22:00	2504	35.7	5						
3月24日	5:00	2397	24.1	8						
3月24日	9:00	2372	24.3	8						
3月24日	11:00	2360	24.4	8						
3月24日	13:00	2340	22.3	8						
3月24日										

6.1	6100
	0
	0
6.3	6300
6.12	6120
6.08	6080
6.08	6080
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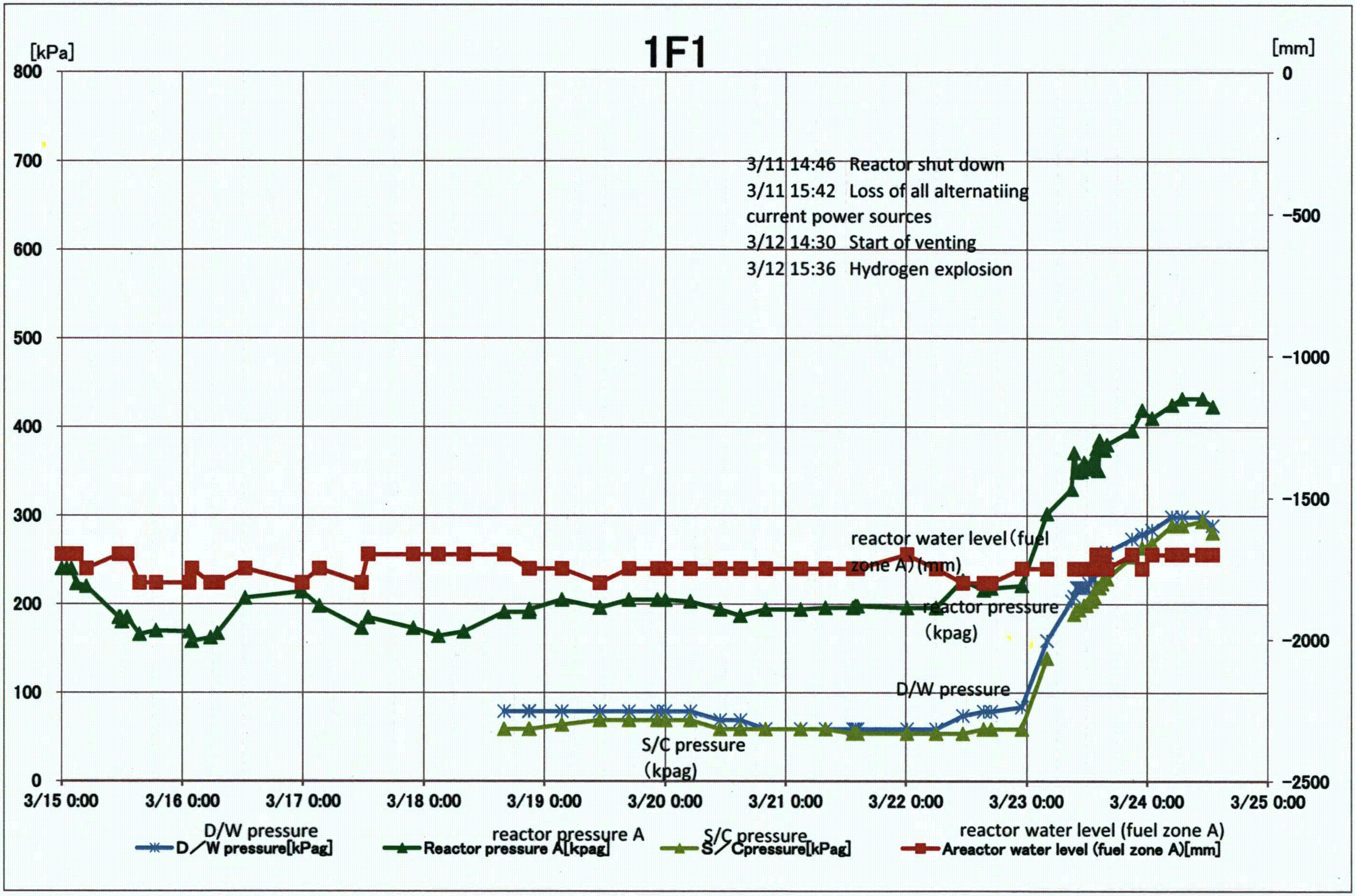
	0
	0
	0
	0
5.45	5450
5.42	5420
5.4	5400
5.4	5400
5.355	5355
5.31	5310
5.648	5648
6.008	6008
7.695	7695
7.515	7515


1F1
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[mm]
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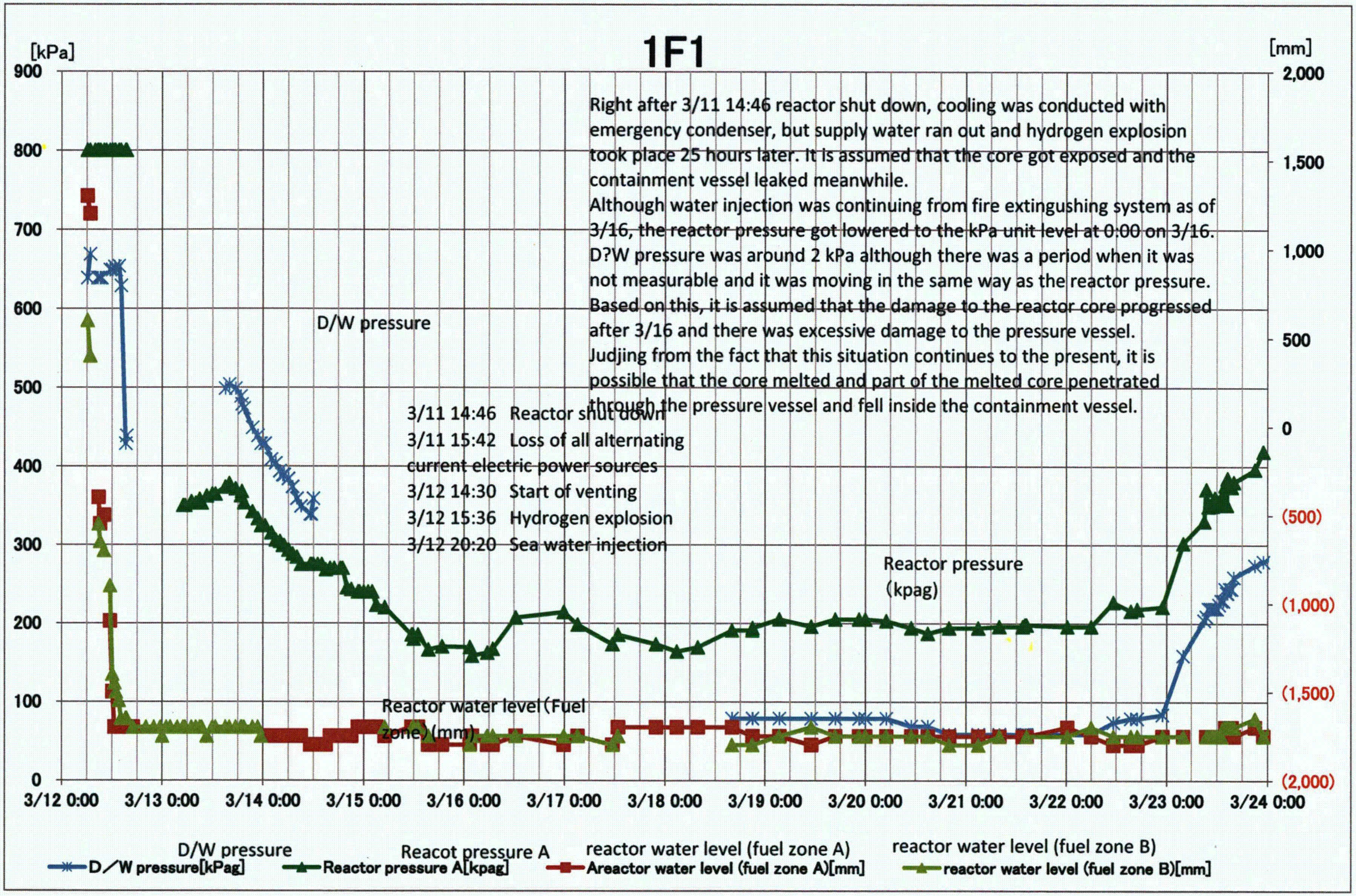
-1000
-1500
-2000
-2500
3/11 14:46 Reactor shut down
3/11 15:42 Loss of all alternatiing current power sources
3/12 14:30 Start of venting
3/12 15:36 Hydrogen explosion
reactor water level (fuel zone A) (mm)
reactor pressure (kpag)
D/W pressure
S/C pressure (kpag)
3/15 0:00
3/16 0:00
3/17 0:00
3/18 0:00
3/19 0:00
3/20 0:00
3/21 0:00
3/22 0:00
3/23 0:00
3/24 0:00
3/25 0:00
D/W pressure
reactor pressure A
S/C pressure
reactor water level (fuel zone A)
D／W pressure[kPag]
Reactor pressure A[kpag]
S／Cpressure[kPag]
Areactor water level (fuel zone A)[mm]


1F1
[kPa]
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(500)
(1,000)
(1,500)
(2,000)
Right after 3/11 14:46 reactor shut down, cooling was conducted with emergency condenser, but supply water ran out and hydrogen explosion took place 25 hours later. It is assumed that the core got exposed and the containment vessel leaked meanwhile.
Although water injection was continuing from fire extingushing system as of 3/16, the reactor pressure got lowered to the kPa unit level at 0:00 on 3/16.
D?W pressure was around 2 kPa although there was a period when it was not measurable and it was moving in the same way as the reactor pressure.
Based on this, it is assumed that the damage to the reactor core progressed after 3/16 and there was excessive damage to the pressure vessel.
Judjing from the fact that this situation continues to the present, it is possible that the core melted and part of the melted core penetrated through the pressure vessel and fell inside the containment vessel.
D/W pressure
3/11 14:46 Reactor shut down
3/11 15:42 Loss of all alternating current electric power sources
3/12 14:30 Start of venting
3/12 15:36 Hydrogen explosion
3/12 20:20 Sea water injection
Reactor pressure (kpag)
Reactor water level (Fuel zone) (mm)
3/12 0:00
3/13 0:00
3/14 0:00
3/15 0:00
3/16 0:00
3/17 0:00
3/18 0:00
3/19 0:00
3/20 0:00
3/21 0:00
3/22 0:00
3/23 0:00
3/24 0:00
D/W pressure
Reacot pressure A
reactor water level (fuel zone A)
reactor water level (fuel zone B)
D／W pressure[kPag]
Reactor pressure A[kpag]
Areactor water level (fuel zone A)[mm]
reactor water level (fuel zone B)[mm]

Date/Time	Main gate froı	MP-7	Near gymnasium (East of ꟿ	Near West Gate (near
2011/3/15 12:10	2142	SE		
2011/3/15 12:15	2434	E		
2011/3/15 12:25	1407	ESE		
2011/3/15 12:30	1362	ESE		
2011/3/15 12:35	1325	SE		
2011/3/15 12:40	1300	SE		
2011/3/15 12:45	1267	S		
2011/3/15 12:50	1242	SSE		
2011/3/15 12:55	1216	S		
2011/3/15 13:00	1191	S		
2011/3/15 13:10	1148	S		
2011/3/15 13:20	1100	SSE		
2011/3/15 13:30	1068	S		
2011/3/15 13:40	1014	SSE		
2011/3/15 13:50	969.9	S		
2011/3/15 14:00	928.2	S		
2011/3/15 14:10	903.9	S		
2011/3/15 14:20	874.4	ESE		
2011/3/15 14:30	855.5	S		
2011/3/15 14:40	821.3	SSE		
2011/3/15 14:50	673.8	E		
2011/3/15 15:00	649	SE		
2011/3/15 15:10	628.5	S		
2011/3/15 15:20	613.8	SE		
2011/3/15 15:30	596.4	S		
2011/3/15 15:40	566.9	SE		
2011/3/15 15:50	544.9	SSE		
2011/3/15 16:00	531.6	S		
2011/3/15 16:10	513.2	SSE		
2011/3/15 16:20	502.6	S		
2011/3/15 16:30	489.8	SSE		
2011/3/15 16:40	473	SSE		
2011/3/15 16:50	460.3	S		
2011/3/15 17:00	449.4	S		
2011/3/15 17:10	437.5	SE		
2011/3/15 17:30	423.5	S		
2011/3/15 18:00	401.7	SE		
2011/3/15 18:30	403	S		
2011/3/15 19:00	353.8	S		
2011/3/15 19:30	343.3	S		
2011/3/15 20:00	347	S		
2011/3/15 20:30	311.3	SSE		
2011/3/15 21:00	298.8	E		
2011/3/15 21:30	282.6	SSE		
2011/3/15 22:00	313.2	SE		
2011/3/15 22:30	431.8	SE		
2011/3/15 23:00	4548	W		
2011/3/15 23:10	6960	N		
2011/3/15 23:15	2761	S		

2011/3/15 23:20	3648	E
2011/3/15 23:25	4976	NW
2011/3/15 23:30	8080	NW
2011/3/15 23:35	6308	E
2011/3/15 23:40	6592	NE
2011/3/15 23:45	6847	NNE
2011/3/15 23:50	6066	E
2011/3/15 23:55	7966	NE
2011/3/16 0:00	4351	NNE
2011/3/16 0:10	3504	NW
2011/3/16 0:20	3108	N
2011/3/16 0:30	2609	NW
2011/3/16 0:40	2432	NW
2011/3/16 0:50	2257	W
2011/3/16 1:00	2159	NW
2011/3/16 1:10	2021	NW
2011/3/16 1:20	1937	NE
2011/3/16 1:30	1805	N
2011/3/16 1:40	1708	NW
2011/3/16 1:50	1628	NW
2011/3/16 2:00	1552	NW
2011/3/16 2:10	1522	NNW
2011/3/16 2:20	1453	NW
2011/3/16 2:30	1386	NW
2011/3/16 2:40	1357	NW
2011/3/16 2:50	1316	NW
2011/3/16 3:00	1267	NW
2011/3/16 3:30	1159	NW
2011/3/16 4:00	1047	N
2011/3/16 4:30	975.3	NNW
2011/3/16 5:00	918.2	NW
2011/3/16 5:30	868	NNW
2011/3/16 6:00	884	NW
2011/3/16 6:30	848.4	W
2011/3/16 6:40	837	WNW
2011/3/16 6:50	815.9	WNW
2011/3/16 7:00	808.8	NW
2011/3/16 7:10	670.3	NW
2011/3/16 7:20	661.8	NW
2011/3/16 7:30	651.1	NW
2011/3/16 7:40	644	W
2011/3/16 7:50	636.8	W
2011/3/16 8:00	627.5	NNW
2011/3/16 8:10	620.6	WNW
2011/3/16 8:20	613.9	NNW
2011/3/16 8:30	606.6	NNW
2011/3/16 8:40	600.4	N
2011/3/16 8:50	593.4	NNW
2011/3/16 9:00	587.6	NW
2011/3/16 9:10	582.2	N
2011/3/16 9:20	582.4	NW

2011/3/16 9:30	582.3	NW		
2011/3/16 9:40	641.8	W		
2011/3/16 9:50	700.6	NNW		
2011/3/16 10:00	810.3	ENE		
2011/3/16 10:10	908.5	NE		
2011/3/16 10:20	2399	ENE		
2011/3/16 10:30	1361	E		
2011/3/16 10:45	6400	ENE		
2011/3/16 10:54	2300	NE		
2011/3/16 10:55	2900	—		
3/16 11:00	3391	NE		
3/16 11:10	2720	NNE		
3/16 11:20	1900	ENE		
3/16 11:30	5350	NE		
3/16 11:40	2633	E		
3/16 11:50	2578	N		
3/16 12:00	4418	ESE		
3/16 12:10	3138	E		
3/16 12:20	3261	N		
3/16 12:30	10850	ENE		
3/16 12:40	8234	W		
3/16 12:50	2851	NW		
3/16 13:00	2672	WSW		
3/16 13:10	2536	WSW		
3/16 13:20	2430	WSW		
3/16 13:30	2331	N		
3/16 13:40	2257	NW		
3/16 13:50	2182	NW		
3/16 14:00	2122	ENE		
3/16 14:10	2059	SSW		
3/16 14:20	2022	SSW		
3/16 14:30	1937	W		
3/16 14:40	1888	WNW		
3/16 14:50	1835	WSW		
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3/16 16:10	1530	SW		
3/16 16:20	1472	NW		
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3/16 17:05			751	
3/16 17:10			749.3	N
3/16 17:20			745.6	NW
3/16 17:30			741.3	WNW
3/16 17:40			738.2	NNW
3/16 17:50			735	NNW
3/16 18:00			731	WNW

3/16 18:10		728 NW	
3/16 18:20		725.9 W	
3/16 18:30		723.3 NW	
3/16 19:00			385.4 NW
3/16 19:30			380.7 NW
3/16 20:00			375.5 NNW
3/16 20:30			373.6 NNW
3/16 21:00			370.2 NNW
3/16 21:30			366.5 NNW
3/16 22:00			363.7 NW
3/16 22:30			361.2 ESE
3/16 23:00			358.8 NNE
3/16 23:30			355.7 NNE
3/17 0:30			351.4 NE
3/17 0:50			350.1 SSW
3/17 1:30			348.2 E
3/17 2:00			345.9 W
3/17 2:30			344.8 NW
3/17 3:00			344.6 W
3/17 3:30			341.7 W
3/17 4:00			340.8 W
3/17 4:30			339.4 NW
3/17 5:00			338.5 W
3/17 5:30			336.1 W
3/17 6:00			334.7 W
3/17 6:30			333.8 W
3/17 7:00			314.5 W
3/17 7:30			313.5 W
3/17 7:50		381.3	
3/17 8:00		379.0	
3/17 8:30		373.0	
3/17 8:40		372.5	
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3/17 9:10		371.9	
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3/17 11:00	647.3		
3/17 11:10	646.2		
3/17 11:15			313.1
3/17 11:20			312.5
3/17 11:30			312.3
3/17 12:00			311.0
3/17 12:30			310.7

3/17 13:00	309.7
3/17 13:10	309.3
3/17 13:20	309.1
3/17 13:30	
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3/17 14:00	
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3/17 21:50	290.9

3/17 22:00	290.4
3/17 22:10	290.4
3/17 22:20	289.9
3/17 22:30	289.7
3/17 22:40	289.6
3/17 22:50	289.5
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3/17 23:20	288.8
3/17 23:30	288.7
3/17 23:40	287.8
3/17 23:50	288.9
3/18 0:00	287.0
3/18 0:10	287.3
3/18 0:20	286.6
3/18 0:30	286.4
3/18 0:40	286.3
3/18 0:50	286.0
3/18 1:00	285.6
3/18 1:10	285.5
3/18 1:20	285.2
3/18 1:30	284.9
3/18 1:40	284.6
3/18 1:50	284.4
3/18 2:00	284.0
3/18 2:10	283.7
3/18 2:20	283.7
3/18 2:30	283.5
3/18 2:40	283.0
3/18 2:50	282.9
3/18 3:00	282.6
3/18 3:10	282.2
3/18 3:20	282.1
3/18 3:30	281.6
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3/18 3:50	281.1
3/18 4:00	281.1
3/18 4:10	280.9
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3/18 5:30	278.9
3/18 5:40	278.9
3/18 5:50	277.1
3/18 6:00	274.0
3/18 6:10	274.0
3/18 6:20	273.8

3/18 6:30	274.1
3/18 6:40	272.7
3/18 6:50	273.4
3/18 7:00	272.4
3/18 7:10	271.7
3/18 7:20	271.6
3/18 7:30	271.4
3/18 7:40	271.1
3/18 7:50	271.2
3/18 8:00	270.5
3/18 8:10	270.3
3/18 8:20	269.9
3/18 8:30	269.9
3/18 8:40	269.8
3/18 8:50	269.2
3/18 9:00	268.7
3/18 9:10	267.6
3/18 9:20	268.9
3/18 9:30	267.5
3/18 9:40	267.0
3/18 9:50	266.9
3/18 10:00	266.7
3/18 10:10	266.4
3/18 10:20	266.1
3/18 10:30	265.7
3/18 10:40	265.4
3/18 10:50	264.8
3/18 11:00	265.0
3/18 11:10	264.4
3/18 11:20	264.5
3/18 11:30	264.1
3/18 11:40	264.4
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3/18 20:30	434.5	WNW
3/18 20:40	429.2	SW
3/18 20:50	423.9	WSW
3/18 21:00	419.1	SSW
3/18 21:10	414.2	W
3/18 21:20	409.4	W
3/18 21:30	405.2	W
3/18 21:40	401.6	NNW
3/18 21:50	397.8	W
3/18 22:00	393.9	SW
3/18 22:10	389.2	SW
3/18 22:20	385.9	W
3/18 22:30	382.9	W
3/18 22:40	379.6	SW

3/18 22:50	375.9	W
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3/19 3:00	306.9	WNW
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3/21 21:50	384.9
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3/21 23:00	352.7	
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3/21 23:50	334.1	
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3/22 0:10	329.3	
3/22 0:20	327.5	
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3/22 0:40	323.9	
3/22 0:50	320.8	
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3/22 1:10	313.0	
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3/22 2:50	296.2	
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3/22 3:50	290.0	
3/22 4:00	288.9	
3/22 4:10	288.1	
3/22 4:20	287.0	
3/22 4:30	286.0	
3/22 4:40	283.6	
3/22 4:50	280.1	
3/22 5:00	273.9	
3/22 5:10	271.0	NW
3/22 5:20	268.0	W
3/22 5:30	267.4	NW
3/22 5:40	265.8	W
3/22 5:50	265.3	W
3/22 6:00	264.6	N
3/22 6:10	264.3	NW
3/22 6:20	265.5	W
3/22 6:30	263.7	WNW
3/22 6:40	262.6	WNW

3/22 6:50	262.1	NW
3/22 7:00	261.9	WNW
3/22 7:10	261.8	NW
3/22 7:20	261.7	WNW
3/22 7:30	261.6	NW
3/22 7:40	261.2	WNW
3/22 7:50	261.0	WNW
3/22 8:00	260.9	WNW
3/22 8:10	260.8	W
3/22 8:20	260.5	W
3/22 8:30	260.3	W
3/22 8:40	260.4	NW
3/22 8:50	260.2	W
3/22 9:00	260.2	W
3/22 9:10	260.1	NW
3/22 9:20	260.0	WNW
3/22 9:30	259.9	NW
3/22 9:40	259.4	W
3/22 9:50	259.5	WNW
3/22 10:00	260.2	WNW
3/22 10:10	259.4	NW
3/22 10:20	258.9	WNW
3/22 10:30	258.7	NW
3/22 10:40	258.4	N
3/22 10:50	257.3	NNW
3/22 11:00	257.5	NNW
3/22 11:10	257.1	N
3/22 11:20	256.9	NNW
3/22 11:30	256.5	W
3/22 11:40	256.5	NNW
3/22 11:50	256.4	NNW
3/22 12:00	256.3	N
3/22 12:10	256.0	N
3/22 12:20	256.1	N
3/22 12:30	256.3	NW
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3/22 12:50	255.8	NNW
3/22 13:00	255.6	N
3/22 13:10	255.7	N
3/22 13:20	255.2	NE
3/22 13:30	254.8	NNW
3/22 13:40	254.8	N
3/22 13:50	254.5	N
3/22 14:00	254.6	NW
3/22 14:10	254.3	NW
3/22 14:20	254.4	N
3/22 14:30	254.3	N
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3/22 14:50	254.4	N
3/22 15:00	254.1	NE
3/22 15:10	255.3	NW

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3/22 15:30	277.5	ESE
3/22 15:40	265.2	E
3/22 15:50	258.8	E
3/22 16:00	274.0	E
3/22 16:10	280.6	SW
3/22 16:20	330.6	SW
3/22 16:30	352.3	W
3/22 16:40	384.2	NNE
3/22 16:50	294.0	N
3/22 17:00	330.8	SE
3/22 17:10	420.4	SE
3/22 17:20	388.7	N
3/22 17:30	351.6	NE
3/22 17:40	278.9	NNW
3/22 17:50	275.2	WNW
3/22 18:00	265.5	W
3/22 18:10	264.1	WNW
3/22 18:20	261.5	NW
3/22 18:30	324.6	W
3/22 18:40	322.8	W
3/22 18:50	303.8	NNW
3/22 19:00	367.9	SW
3/22 19:10	361.1	SW
3/22 19:20	320.9	WSW
3/22 19:30	472.7	SW
3/22 19:40	340.7	W
3/22 19:50	258.0	WNW
3/22 20:00	254.1	WNW
3/22 20:10	253.4	W
3/22 20:20	252.5	WNW
3/22 20:30	251.5	NW
3/22 20:40	250.5	NW
3/22 20:50	249.1	W
3/22 21:00	246.1	W
3/22 21:10	244.4	SW
3/22 21:20	242.8	W
3/22 21:30	241.0	W
3/22 21:40	240.6	NW
3/22 21:50	239.5	WNW
3/22 22:00	239.3	WNW
3/22 22:10	237.0	W
3/22 22:20	237.4	W
3/22 22:30	236.2	WSW
3/22 22:40	235.7	WNW
3/22 22:50	235.8	W
3/22 23:00	235.9	W
3/22 23:10	235.9	WNW
3/22 23:20	235.5	WNW
3/22 23:30	234.8	WNW
3/22 23:40	234.1	WNW

3/22 23:50	233.8	NW
3/23 0:00	233.4	NW
3/23 0:10	233.3	NW
3/23 0:20	232.3	NNW
3/23 0:30	231.6	W
3/23 0:40	230.1	NW
3/23 0:50	229.4	NE
3/23 1:00	227.5	N
3/23 1:10	227.4	NE
3/23 1:20	227.2	NNW
3/23 1:30	226.8	NNW
3/23 1:40	226.8	NNW
3/23 1:50	226.7	N
3/23 2:00	226.7	N
3/23 2:10	226.9	N
3/23 2:20	227.1	NW
3/23 2:30	227.1	N
3/23 2:40	227.2	N
3/23 2:50	227.3	NW
3/23 3:00	227.6	NNW
3/23 3:10	228.5	N
3/23 3:20	228.7	NNW
3/23 3:30	228.8	NNW
3/23 3:40	228.8	N
3/23 3:50	229.0	NW
3/23 4:00	229.1	N
3/23 4:10	229.1	NW
3/23 4:20	229.4	NNW
3/23 4:30	229.3	NW
3/23 4:40	229.5	NNW
3/23 4:50	229.5	N
3/23 5:00	229.5	N
3/23 5:10	229.3	N
3/23 5:20	229.6	NNW
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3/23 5:40	229.5	NNW
3/23 5:50	229.7	NW
3/23 6:00	229.6	NNW
3/23 6:10	229.6	NNW
3/23 6:20	229.4	NW
3/23 6:30	229.6	NNW
3/23 6:40	229.5	NW
3/23 6:50	229.5	NNW
3/23 7:00	229.3	NNW
3/23 7:10	229.5	NNW
3/23 7:20	229.3	NNW
3/23 7:30	229.5	NNW
3/23 7:40	229.0	N
3/23 7:50	229.3	N
3/23 8:00	229.4	N
3/23 8:10	229.5	N

3/23 8:20	229.2	NNW
3/23 8:30	229.4	NNW
3/23 8:40	229.1	NNW
3/23 8:50	229.1	NNW
3/23 9:00	229.1	N
3/23 9:10	228.7	NNE
3/23 9:20	227.6	N
3/23 9:30	226.9	N
3/23 9:40	228.6	NNE
3/23 9:50	227.6	NNE
3/23 10:00	211.4	N
3/23 10:10	227.7	N
3/23 10:20	227.2	NNE
3/23 10:30	227.3	N
3/23 10:40	227.1	NNW
3/23 10:50	227.2	N
3/23 11:00	227.0	NNW
3/23 11:10	226.8	N
3/23 11:20	226.8	NNE
3/23 11:30	226.3	NNE
3/23 11:40	225.7	N
3/23 11:50	226.3	N
3/23 12:00	225.2	NNW
3/23 12:10	226.0	NNE
3/23 12:20	224.8	W
3/23 12:30	224.9	W
3/23 12:40	224.7	WNW
3/23 12:50	224.8	E
3/23 13:00	225.4	E
3/23 13:10	224.8	ESE
3/23 13:20	225.7	N
3/23 13:30	224.1	N
3/23 13:40	223.7	NE
3/23 13:50	222.7	NW
3/23 14:00	222.4	N
3/23 14:10	231.1	NE
3/23 14:20	435.0	ESE
3/23 14:30	288.7	E
3/23 14:40	309.7	ESE
3/23 14:50	267.8	ESE
3/23 15:00	265.4	NE
3/23 15:10	396.0	N
3/23 15:20	415.6	E
3/23 15:30	414.7	SSE
3/23 15:40	401.6	ESE
3/23 15:50	318.4	ESE
3/23 16:00	331.5	E
3/23 16:10	313.4	S
3/23 16:20	280.9	SE
3/23 16:30	283.7	SSW
3/23 16:40	274.4	SSE

3/23 16:50	269.3	SW
3/23 17:00	265.1	N
3/23 17:10	262.1	E
3/23 17:20	259.5	NNW
3/23 17:30	257.0	NW
3/23 17:40	255.8	W
3/23 17:50	254.2	WNW
3/23 18:00	253.0	NW
3/23 18:10	251.3	NNW
3/23 18:20	241.2	N
3/23 18:30	249.0	NW
3/23 18:40	246.9	NNW
3/23 18:50	245.8	NE
3/23 19:00	244.6	N
3/23 19:10	243.5	N
3/23 19:20	242.1	N
3/23 19:30	241.0	NNE
3/23 19:40	240.2	W
3/23 19:50	237.6	WSW
3/23 20:00	236.5	NNE
3/23 20:10	235.8	E
3/23 20:20	235.3	SW
3/23 20:30	234.3	SW
3/23 20:40	233.2	E
3/23 20:50	232.8	E
3/23 21:00	232.3	WSW
3/23 21:10	231.5	SE
3/23 21:20	230.6	SSE
3/23 21:30	230.2	SW
3/23 21:40	229.5	W
3/23 21:50	228.8	WSW
3/23 22:00	228.3	W
3/23 22:10	227.3	W
3/23 22:20	226.8	W
3/23 22:30	226.5	W
3/23 22:40	225.8	WNW
3/23 22:50	225.4	WNW
3/23 23:00	224.9	W
3/23 23:10	224.7	NW
3/23 23:20	224.3	W
3/23 23:30	224.0	W
3/23 23:40	223.0	SW
3/23 23:50	223.0	SE
3/24 0:00	222.3	NW
3/24 0:10	222.0	S
3/24 0:20	221.8	N
3/24 0:30	221.5	W
3/24 0:40	221.7	WNW
3/24 0:50	221.0	WNW
3/24 1:00	220.6	WNW
3/24 1:10	220.4	WNW

3/24 1:20	220.0	NW
3/24 1:30	219.7	N
3/24 1:40	219.2	NW
3/24 1:50	219.2	W
3/24 2:00	218.9	WNW
3/24 2:10	218.7	WNW
3/24 2:20	217.5	WNW
3/24 2:30	217.2	WNW
3/24 2:40	216.8	W
3/24 2:50	216.6	WSW
3/24 3:00	216.6	W
3/24 3:10	216.5	WSW
3/24 3:20	216.2	SW
3/24 3:30	215.5	SW
3/24 3:40	215.7	W
3/24 3:50	215.4	W
3/24 4:00	215.1	WNW
3/24 4:10	215.0	N
3/24 4:20	214.7	S
3/24 4:30	214.5	N
3/24 4:40	214.7	NNW
3/24 4:50	214.3	W
3/24 5:00	214.4	SE
3/24 5:10	214.0	
3/24 5:20	213.6	
3/24 5:30	213.8	
3/24 5:40	216.2	
3/24 5:50	213.6	
3/24 6:00	212.8	
3/24 6:10	212.8	
3/24 6:20	214.7	
3/24 6:30	230.9	
3/24 6:40	213.7	
3/24 6:50	212.3	
3/24 7:00	212.2	
3/24 7:10	212.0	
3/24 7:20	211.8	
3/24 7:30	211.9	
3/24 7:40	211.9	
3/24 7:50	211.7	
3/24 8:00	211.6	
3/24 8:10	211.6	
3/24 8:20	211.6	
3/24 8:30	211.2	
3/24 8:40	211.5	
3/24 8:50	211.1	
3/24 9:00	210.1	
3/24 9:10	210.8	
3/24 9:20	210.8	
3/24 9:30	210.7	
3/24 9:40	210.6	

3/24 9:50	210.5
3/24 10:00	210.1
3/24 10:10	210.0
3/24 10:20	209.7
3/24 10:30	209.7
3/24 10:40	209.5
3/24 10:50	209.6
3/24 11:00	209.3
3/24 11:10	209.2
3/24 11:20	209.5
3/24 11:30	209.5
3/24 11:40	209.6
3/24 11:50	209.1
3/24 12:00	209.4
3/24 12:10	209.4
3/24 12:20	209.2
3/24 12:30	201.1
3/24 12:40	208.8
3/24 12:50	208.7
3/24 13:00	208.1
3/24 13:10	207.9
3/24 13:20	207.5
3/24 13:30	207.5
3/24 13:40	207.2
3/24 13:50	209.3
3/24 14:00	209.0
3/24 14:10	208.5
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North of Administrative Head Bldg.

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3728 SW
3699 SSW
3669 S
3634 WSW
3611 WSW

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3256 SW
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3279 WSW
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3195 WSW
3188 SW
3181 WSW

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2768 SE
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3056 SE
3202 SSE
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3054 SSE
3071 S
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3003 S
3046 SSE
3171 S
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2851 S
2830 SSW
2960 S
2839 SSW
2773 S
2763 SW
2758 SSW
2729 SE
2715 SSW
2707 SW
2693 SSW
2680 S
2673 S
2658 SW
2651 WSW
2658 NNE
2623 W
2683 WSW
2614 SW
2602 SW
2595 NNW
2632 NE
2828 W
2704 NE
2682 NW

2586 W
2552 WNW
2550 NW
2542 WNW
2537 W
2532 WNW
2518 W
2517 W
2510 WNW
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2503 NW
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2375 WNW
2372 W
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2362 WNW
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2347 WNW
2345 WNW

2343 W
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2326 SW
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2319 NE
2312 E
2293 E
2283 NNE
2271 NNE
2251 NE
2232 NW
2215 NW
2200 WSW
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2161 NW
2147 NW
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2111 NW
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2092	E	
2089	NE	
2068	NE	
2064	NE	
2053	N	
2043	NE	
2039	NE	
2035	N	
2029	NE	
2019	N	
2019	N	
2013	NE	
2013	NE	
2012	NE	
2013	NE	
2016	N	
2013	NE	
2011	N	
2015	NE	
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	ESE	White smoke at 1F-2
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			L	Pr	Pdw
3/12/2011	0:30	3/12 0:30	3970	7.35	155
	1:00	3/12 1:00	4170	7.4	240
	1:25	3/12 1:25	4470	7.1	245
	2:30	3/12 2:30	4520	7.34	245
	2:55	3/12 2:55	4520	7.34	245
	3:40	3/12 3:40	4520	7.34	245
	3:55	3/12 3:55	4170	7.47	285
	4:48	3/12 4:48	4170	7.47	285
	4:30	3/12 4:30	4170	7.47	285
	5:30	3/12 5:30	4220	7.3	305
	6:00	3/12 6:00	4170	7.43	305
	6:30	3/12 6:30	4220	7.49	320
	7:15	3/12 7:15	4220	7.39	330
	7:30	3/12 7:30	4220	7.23	340
	8:40	3/12 8:40	4230	7.52	350
	9:15	3/12 9:15	4230	7.46	360
	9:40	3/12 9:40	4230	7.46	360
	10:04	3/12 10:04	4240	7.46	350
	10:52	3/12 10:52	4240	7.46	350
	11:20	3/12 11:20	4240	7.36	350
	11:30	3/12 11:30	4240	7.36	360
	11:41	3/12 11:41	4240	7.36	360
	12:05	3/12 12:05	4240	7.36	360
	12:35	3/12 12:35	4240	7.53	390
	12:55	3/12 12:55	4260	5.6	380
	13:38	3/12 13:38	4170	4	360
	13:50	3/12 13:50	4170	4	360
	14:10	3/12 14:10	4590	3.63	360
	14:41	3/12 14:41	4590	3.63	360
	14:50	3/12 14:50	4590	3.63	360
	15:14	3/12 15:14	4590	3.63	360
	15:28	3/12 15:28	4590	3.63	360
	17:00	3/12 17:00	4570	2.9	300
	17:35	3/12 17:35	5070	2.1	295
	18:00	3/12 18:00	5120	1.7	290
	18:30	3/12 18:30	5370	1.35	280
	19:00	3/12 19:00	5220	0.95	285
	19:42	3/12 19:42	5470	0.82	280
	20:15	3/12 20:15	5620	0.8	270
	21:00	3/12 21:00	5920	0.72	270
	22:00	3/12 22:00		0.97	270
	23:00	3/12 23:00		0.96	
3/13/2011	0:00	3/13 0:00		0.97	
	1:00	3/13 1:00		0.97	
	2:00	3/13 2:00		0.85	
	3:00	3/13 3:00		0.58	

	3:38	3/13 3:38		4.1
	5:00	3/13 5:00	-2000	7.38
	5:30	3/13 5:30	-2400	7.27
	6:00	3/13 6:00	-2600	7.39
	6:30	3/13 6:30	-2800	7.39
	7:00	3/13 7:00	-2850	7.35
	7:30	3/13 7:30	-2950	7.33
	8:00	3/13 8:00	-3000	7.27
	8:20	3/13 8:20	-3250	7.24
	9:10	3/13 9:10	1800	7.24
	9:25	3/13 9:25	1000	0.35
	9:55	3/13 9:55	600	0.24
	10:35	3/13 10:35	-700	
	10:55	3/13 10:55	-1200	0.1
	11:25	3/13 11:25	0	0.11
	11:55	3/13 11:55	1000	0.12
	12:40	3/13 12:40	-1400	0.45
	13:00	3/13 13:00	-2000	0.19
	14:10	3/13 14:10	-2200	0.08
	15:00	3/13 15:00	-2000	0.09
	16:00	3/13 16:00	-2000	0.18
	16:15	3/13 16:15	-2000	0.19
	16:45	3/13 16:45	-1900	0.24
	17:00	3/13 17:00	-1800	0.24
	17:30	3/13 17:30	-2100	0.24
	18:45	3/13 18:45	-2200	0.25
	19:30	3/13 19:30	-2200	0.25
	19:55	3/13 19:55	-2200	0.25
	20:45	3/13 20:45	-2200	
	21:40	3/13 21:40	-2200	
	22:05	3/13 22:05	-2250	
	22:20	3/13 22:20	-2250	
	23:00	3/13 23:00	-2250	0.089
	23:30	3/13 23:30	-2250	0.068
3/14/2011	0:30	3/14 0:30	-2250	0.051
	2:00	3/14 2:00	-2250	0.079
	3:00	3/14 3:00	-2300	0.134
	4:00	3/14 4:00	-2800	0.159
	4:40	3/14 4:40	-3500	0.159
	5:00	3/14 5:00		0.181
	6:00	3/14 6:00		0.181
	7:00	3/14 7:00		0.338