From: LIA05 Hoc
Sent: Wednesday, March 30, 2011 4:20 PM
To: FOIA Response.hoc Resource
Subject: FW: Tonight's call with DOE

Bonnie Sheffield Dayshift 0700-1500
Ken Wierman Nightshift 1500-2300
FEMA REP Liaison
NRC Operations Center
(301) 816-5187

********~~FOR OFFICIAL USE ONLY******~~**
DO NOT RELEASE OUTSIDE OF THE FEDERAL FAMILY

From: LIA04 Hoc
Sent: Thursday, March 17, 2011 6:47 PM
To: Piccone, Josephine; Jackson, Deborah; OST05 Hoc; LIA06 Hoc; LIA05 Hoc; LIA01 Hoc; LIA11 Hoc; Barker, Allan; Browder, Rachel; Erickson, Randy; Logaras, Harral; Maier, Bill; McNamara, Nancy; Tifft, Doug; Trojanowski, Robert; Woodruff, Gena; Flannery, Cindy; LIA04 Hoc; Lukes, Kim; Noonan, Amanda; Rautzen, William; Rivera, Alison; Ryan, Michelle; Turtil, Richard; Virgilio, Rosetta; Collins, Elmo; Dean, Bill; Heck, Jared; McCree, Victor; Pederson, Cynthia; Satorius, Mark
Subject: Tonight's call with DOE

We have learned that tonight's 19:00 call with DOE with the States is in fact:

A meeting organized by the White House (NSS - National Security Staff) for Western Governors and Territories.

The following agenda was communicated by a DOE individual (A.J. Gibson):

1st. Coordinated Strategic Call – 19:00 EDT (Governors are being contacted by the White House)

1) Introductions
2) Briefing Update – Intergovernmental Agencies
3) Reactor Situation in Japan – DOE
4) Humanitarian/Effects on U.S. Citizens – State Department
5) Discussion of Monitoring – U.S. EPA
6) Potential Health Effects - HHS
7) Open Discussion – Intergovernmental Agencies
8) Summary - All

NRC will be a party to this call, but we are not expected to speak.

Richard Turtil
State Liaison – Liaison Team
Incident Response Center

PPPP/107

Mitchell, Mark

From: ronald.chrzanowski@exeloncorp.com
Sent: Wednesday, March 30, 2011 2:40 PM
To: tolewis@state.pa.us; Mitchell, Mark; Phalen, Martin
Cc: jamison.rappeport@exeloncorp.com; allen.creamean@exeloncorp.com; timmie.kaffenbarger@exeloncorp.com; Joan.Knight@exeloncorp.com; Pinder.Mankoo@exeloncorp.com; ken.lyons@exeloncorp.com; vicki.neels@exeloncorp.com; Keith.Volker@exeloncorp.com; christopher.cooney@exeloncorp.com; Michael.Ford3 @exeloncorp.com; Trevor.Orth@exeloncorp.com; peter.orphanos@exeloncorp.com
Subject: Exelon Nuclear site measurements of Japanese Fallout Data
Attachments: Japanese Fallout data 033011.xls

I have attached the rainwater and air cartridge data from control locations that we have been able to collect and have analyzed to date.

There is no milk data available at this time. It takes longer to prepare the milk samples and I expect to have those by Monday. However, as you can imagine, the Laboratory that we use to perform these analysis is receiving requests from all of their customers and it is taking longer than usual to perform the analysis due to the volume. I expect to have Oyster Creek air data tomorrow and will update this spreadsheet when I have that.

I ask that if any of this data is shared to please let me know who it was shared with.

To be complete, Quad Cities, Byron, LaSalle, Clinton, Dresden and Braidwood stations are in Illinois. I have listed them from West to East in location.

TMI, Peach Bottom, Limerick are in Pennsylvania.

Oyster Creek is in New Jersey.

I will continue to update you when additional data is available.

Ron Chrzanowski
Exelon Nuclear
Corporate Chemistry Manager
630-657-3200

PPPP/102

Date	Location	Type	Control	Detail	I-131 (pCi/L)	Comments
3/23/2011	Limerick	rain (roof drain)	Yes	offsite	92.7	6 miles nnw from Limerick
3/23/2011	TMI	rain	Yes	MS-1	95.4	Control/background location
3/24/2011	Oyster	rain	Yes		127.0	Met Tower Road
3/25/2011	TMI	rain	Yes	MS-1	51.1	
3/24/2011	Quad Cities	rain (roof drain)	Yes	offsite	39.0	10 mile ssw of plant Port Byron, IL
3/24/2011	Quad Cities	rain (roof drain)	Yes	offsite	19.4	15 mile west Bettendorf, IA

Date	Location	Type	Control	Detail	I-131 (pCi/m3)	Comments
3/14/2011 9:42	Limerick	REMP/charcoal	Yes	22G1	Not Detected	
3/14/2011 9:44	Peach Bottom	REMP/charcoal	yes	5H2	Not Detected	
3/15/2011 12:35	Byron	REMP/charcoal	Yes	BY-08	Not Detected	
3/16/2011 12:50	TMI	REMP/charcoal	Yes	TM-AI-Q15-1	Not Detected	
3/17/2011 8:40	LaSalle	REMP/charcoal	Yes	L-10	Not Detected	
3/17/2011 15:40	Braidwood	REMP/charcoal	Yes	BD-03	Not Detected	
3/17/2011 15:40	Braidwood	REMP/charcoal	Yes	BD-03 DUP	Not Detected	
3/18/2011 8:00	Dresden	REMP/charcoal	Yes	D-12	Not Detected	
3/18/2011 13:40	Quad Cities	REMP/charcoal	Yes	Q-42	Not Detected	
3/22/2011 9:46	Limerick	REMP/charcoal	Yes	22G1	Not Detected	
3/22/2011 9:48	Peach Bottom	REMP/charcoal	Yes	5H2	Not Detected	
3/22/2011 13:05	Byron	REMP/charcoal	Yes	BY-08	0.100	

Date	Location	Type	Control	Detail	I-131 (pCi/m3)	Comments
3/14/2011 9:42	Limerick	REMP/charcoal	Yes	22G1	Not Detected	
3/14/2011 9:44	Peach Bottom	REMP/charcoal	yes	5H2	Not Detected	
3/15/2011 12:35	Byron	REMP/charcoal	Yes	BY-08	Not Detected	
3/16/2011 12:50	TMI	REMP/charcoal	Yes	TM-AI-Q15-1	Not Detected	
3/17/2011 8:40	LaSalle	REMP/charcoal	Yes	L-10	Not Detected	
3/17/2011 15:40	Braidwood	REMP/charcoal	Yes	BD-03	Not Detected	
3/17/2011 15:40	Braidwood	REMP/charcoal	Yes	BD-03 DUP	Not Detected	
3/18/2011 8:00	Dresden	REMP/charcoal	Yes	D-12	Not Detected	
3/18/2011 13:40	Quad Cities	REMP/charcoal	Yes	Q-42	Not Detected	
3/22/2011 9:46	Limerick	REMP/charcoal	Yes	22G1	Not Detected	
3/22/2011 9:48	Peach Bottom	REMP/charcoal	Yes	5H2	Not Detected	
3/22/2011 13:05	Byron	REMP/charcoal	Yes	BY-08	0.100	

Date	Location	Type	Control	Detail	I-131 (pCi/m3)	Comments

Mitchell, Mark

From: ronald.chrzanowski@exeloncorp.com
Sent: Thursday, March 31, 2011 4:29 PM
To: Mitchell, Mark; Phalen, Martin; larry.haskell@illinois.gov; tolewis@state.pa.us; TLevering@mde.state.md.us
Cc: peter.orphanos@exeloncorp.com; vince.cwietniewicz@exeloncorp.com; david.helker@exeloncorp.com; Darin.Benyak@exeloncorp.com
Subject: Updated Exelon Nuclear Data
Attachments: Japanese Fallout data 033111.xls

I have updated the attached air table. There are no milk samples to date. I expect to have some milk data early next week. All other samples as of yesterday have been analyzed.

All new data is shown in Blue in the attachment.

I have also included the coordinates for the sample locations for the PA plants as requested.

Ron Chrzanowski
Exelon Nuclear
Corporate Chemistry Manager
630-657-3200

PPPP/103

Date	Location	Type	Control	Detail	I-131 (pCi/L)	Comments
3/23/2011	Limerick	rain (roof drain)	Yes	offsite	92.7	6 miles nnw from Limerick
3/23/2011	TMI	rain	Yes	MS-1	95.4	Control/background location
3/24/2011	Oyster	rain	Yes		127.0	Met Tower Road
3/25/2011	TMI	rain	Yes	MS-1	51.1	
3/24/2011	Quad Cities	rain (roof drain)	Yes	offsite	39.0	10 mile ssw of plant Port Byron, IL
3/24/2011	Quad Cities	rain (roof drain)	Yes	offsite	19.4	15 mile west Bettendorf, IA

3/14/2011 9:42	Limerick	REMP/charcoal	Yes	22G1	Not Detected		
3/14/2011 9:44	Peach Bottom	REMP/charcoal	yes	5H2	Not Detected		N 40o 02' 03.7"
3/15/2011 12:35	Byron	REMP/charcoal	Yes	BY-08	Not Detected		
3/16/2011 12:50	TMI	REMP/charcoal	Yes	TM-AI-Q15-1	Not Detected		
3/17/2011 8:40	LaSalle	REMP/charcoal	Yes	L-10	Not Detected		
3/17/2011 15:40	Braidwood	REMP/charcoal	Yes	BD-03	Not Detected		
3/17/2011 15:40	Braidwood	REMP/charcoal	Yes	BD-03 DUP	Not Detected		
3/18/2011 8:00	Dresden	REMP/charcoal	Yes	D-12	Not Detected		
3/18/2011 13:40	Quad Cities	REMP/charcoal	Yes	Q-42	Not Detected		
3/22/2011 9:46	Limerick	REMP/charcoal	Yes	22G1	Not Detected		
3/22/2011 9:48	Peach Bottom	REMP/charcoal	Yes	5H2	Not Detected		N 40o 02' 03.7"
3/22/2011 13:05	Byron	REMP/charcoal	Yes	BY-08	0.100		
3/16/2011 9:16	Oyster Creek	REMP/charcoal	Yes	C	Not Detected		
3/16/2011 10:48	Clinton	REMP/charcoal	Yes	CL-11	Not Detected		
3/23/2011 8:36	Oyster Creek	REMP/charcoal	Yes	C	Not Detected		
3/23/2011 10:38	Clinton	REMP/charcoal	Yes	CL-11	Not Detected		
3/24/2011 8:40	LaSalle	REMP/charcoal	Yes	L-10	0.06561		
3/25/2011 8:00	Dresden	REMP/charcoal	Yes	D-12	0.07316		
3/24/2011 15:00	Braidwood	REMP/charcoal	Yes	BD-03	0.04964		
3/23/2011 12:55	TMI	REMP/particulate	Yes	TM-AP-Q15-1	0.05048	NW	N 40° 16' 38.9"
3/23/2011 12:55	TMI	REMP/charcoal	Yes	TM-AI-Q15-1	0.05654	NW	N 40° 16' 38.9"

W 75o 48' 48.2"

W 75o 48' 48.2"

W 76° 55' 10.6"	13.4	309
W 76° 55' 10.6"	13.4	309

Date	Location	Type	Control	Detail	I-131 (pCi/m3)	Comments

Bano, Mahmooda

From: Hochevar, Albert R. (INPO) [HochevarAR@INPO.org]
Sent: Thursday, March 31, 2011 11:11 AM
To: Jackson, Todd; Miller, Marie
Cc: INPOERCAssistance; INPO EmergencyResponseCtr (INPO); INPOERCTech; Nielsen, Rick M (INPO); Scott, Michael; Dorman, Dan; Monninger, John
Subject: FW: High Rad Open Pools and Trenches. Completed action
Attachments: Deliverable - High Rad Open Pools-Trenches.pdf

Todd and Marie,
Here is the information that Mr. Hosono requested the other night regarding people who have worked with highly radioactive water.
Al

From: Nielsen, Rick M (INPO)
Sent: Thursday, March 31, 2011 11:48 PM
To: Hochevar, Albert R. (INPO)
Cc: Addy, Robert J (INPO); Bramblett, Jeff W.
Subject: High Rad Open Pools and Trenches. Completed action

This should close out the action, Al.

From: Bramblett, Jeff W.
Sent: Thursday, March 31, 2011 10:23 AM
To: INPOERCAssistance
Cc: Nielsen, Rick M (INPO); Addy, Robert J (INPO)
Subject:

Attached is the industry support team response to industry contacts with experience handling open pools/trenches of high dose water (IST#5). Please forward to Al Hochevar.

NOTE: The IST responses have not received much input on DOE and DOD experience with highly radioactive liquid mixtures. It may be work an action through the government organizations to look for this information in parallel. This may have already been done.

Jeff

PPPP\104

From: Hoc, PMT12
Sent: Thursday, March 31, 2011 2:37 PM
To: ET07 Hoc
Cc: Boger, Bruce; Giitter, Joseph
Subject: RE: 0600 31 March Turnover "One-Pager"
Attachments: PMT Input to March 31 0600 EDT one pager.docx

Sent to ET staff

Jane, our input is the last paragraph

thanks

From: Boger, Bruce
Sent: Thursday, March 31, 2011 2:21 PM
To: Hoc, PMT12
Subject: FW: 0600 31 March Turnover "One-Pager"

From: Morris, Scott
Sent: Thursday, March 31, 2011 6:40 AM
To: LIA07 Hoc; Boger, Bruce; Wiggins, Jim; Giitter, Joseph
Subject: 0600 31 March Turnover "One-Pager"

See attached … Didn't change much from last night.

PPPP/105

From: LIA07 Hoc
Sent: Thursday, March 31, 2011 6:47 AM
To: OST04 Hoc
Subject: FW: 0600 31 March Turnover "One-Pager"
Attachments: March 31 0600 EDT one pager.docx

From: Morris, Scott
Sent: Thursday, March 31, 2011 6:40 AM
To: LIA07 Hoc; Boger, Bruce; Wiggins, Jim; Giitter, Joseph
Subject: 0600 31 March Turnover "One-Pager"

See attached … Didn't change much from last night.

PPPP/106

From: LIA07 Hoc
Sent: Thursday, March 31, 2011 6:48 AM
To: LIA07 Hoc; Borchardt, Bill; Bradford, Anna; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update - 0630 EDT, March 31, 2011
Attachments: March 31 0600 EDT one pager.docx

Attached, please find updated information for the "Go Books".

The updates include:

- The 0600 EDT 03/31/11 One-Pager Briefing Sheet

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

-Jim

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

PPPP/107

Bano, Mahmooda

From: Hochevar, Albert R. (INPO) [HochevarAR@INPO.org]
Sent: Thursday, March 31, 2011 3:31 AM
To: Miller, Marie; Jackson, Todd
Cc: Monninger, John; Blamey, Alan; Scott, Michael; INPOERCAssistance; INPO EmergencyResponseCtr (INPO); INPOERCTech; Dorman, Dan
Subject: WATER TREATMENT AND SHIELDING

Marie and Todd,

I have a file of radioactive water treatment processes in response to NISA's concerns expressed this morning. It is too big to send via e-mail – was kicked back. Also please see the following link talking about Areva's expertise in this area. http://www3.nhk.or.jp/daily/english/society.html I attached a hard copy for your convenience. I thought we delivered this document regarding water treatment earlier, but cannot remember.

INPO is working on locating shielding experts in terms of design, fabrication, and installation. I also have the people from GE, Hitachie, Westinghouse, and EPRI in the TEPCO industry support team room also investigating the availability of shielding expertise in Japan as well as radioactive waste water treatment – a two pronged approach in both areas.

Thanks,

Al
Al Hochevar
Deputy Director,
Organizational Effectiveness Team Leaders.
Institute of Nuclear Power Operations
(770) 644-8382

PPPP/158

From:	OST01 HOC
Sent:	Sunday, April 17, 2011 3:02 PM
To:	Jaczko, Gregory; Virgilio, Martin; Weber, Michael; Boger, Bruce; Johnson, Michael; Zimmerman, Roy; Uhle, Jennifer; Tracy, Glenn; Wiggins, Jim; Carpenter, Cynthia; Moore, Scott
Cc:	Orders, William; Snodderly, Michael; Franovich, Mike; Castleman, Patrick; Hipschman, Thomas
Subject:	FW: One Pager April 17 1500EDT
Attachments:	One Pager - April 17 1500EDT.pdf

*** Please note that this information is "Official Use Only" ***

PPPP/109

Heck, Jared

From: Logaras, Harral
Sent: Friday, April 01, 2011 4:27 PM
To: LIA04 Hoc
Cc: Barker, Allan; Heck, Jared
Subject: RE: I-131 question from Ohio

Thank you! This is an excellent response.

Sincerely,

Harral Logaras
U. S. NRC Region III
Regional Government Liaison
630-829-9659

Link to the *Award Winning* NRC Information Digest http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/v22/sr1350v22.pdf

Link to NRC Fact Sheets and Brochures http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/

From: LIA04 Hoc
Sent: Friday, April 01, 2011 2:52 PM
To: Logaras, Harral
Cc: Heck, Jared; Barker, Allan
Subject: RE: I-131 question from Ohio

Harral, please see the response provided by PMT below:

We cannot address the statements made at the NEMA meeting. However, the EPA RadNET system (http://www.epa.gov/japan2011/)has been collecting data that shows elevated concentrations of I-131 and Cs-137 from air monitoring stations. (http://www.epa.gov/japan2011/docs/rert/radnet-cart-filter-final.pdf).

The EPA EOC can be contacted at 202-250-8930 if further information is requested.

Thanks,
Alison Rivera
State Liaison
NRC HQ Operations Center
301-816-5193

From: Logaras, Harral
Sent: Friday, April 01, 2011 1:56 PM
To: LIA04 Hoc
Cc: Heck, Jared; Barker, Allan
Subject: I-131 question from Ohio

Dear Kim,

We have a question from Ohio, and before I respond from here, I wanted to check with the Liaison Desk to see if we have pertinent information. The State Director of Emergency Response indicated she was told at a National Emergency Management Association (NEMA) meeting last week "...material wouldn't be deposited here (in the U. S.) because the release didn't reach high enough." " Our (Ohio's) best guess is that the I-131 gas diffused up into the

PPPP/110

atmosphere and was blown over to the U.S." She is asking directly: " Is this correct or is another mechanism (for changes in local I-131 readings) at work?"

So do we have any information that would indicate the source and associated mechanism for changes in I-131 monitoring by the States is from anything other than weather patterns transporting I-131 from the damaged reactors in Japan ?

Sincerely,

Harral Logaras
U. S. NRC Region III
Regional Government Liaison
630-829-9659

Link to the *Award Winning* NRC Information Digest http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/v22/sr1350v22.pdf

Link to NRC Fact Sheets and Brochures http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/

From: Burnell, Scott
To: Hayden, Elizabeth; Brenner, Eliot; Harrington, Holly
Subject: WH call wrapup
Date: Friday, April 01, 2011 6:34:52 PM

Nothing of major social significance for us, although DOE did say they were supporting US

NNSA said Japan's asking for survey flights near Narita (major airport) to help prepare for planting season.

EPA & USDA have additional staff and assets in Pacific locations for monitoring

FDA added six prefectures to the import ban list

Everyone reiterated the "no harmful levels" language we started.

Only question from L.A. about cargo monitoring at Long Beach, CPB said prior coordination making for smooth process, longshoremen totally unconcerned about CPB doing rad monitoring in normal clothing.

PPPP/111

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - jaczko
Date: Friday, April 01, 2011 8:36:49 PM

News **1** new result for **jaczko**

Wolf Creek nuclear plant among three in US that need more oversight, NRC reports
Kansas City Star
NRC chairman Gregory **Jaczko** stressed that all 65 nuclear generating stations, which have a total of 104 reactors, are operating safely. But **Jaczko** said Wolf Creek and two others need a higher level of review because of continuing problems with safety **...**
See all stories on this topic »

Kansas City Star

Tip: Use a plus sign (+) to match a term in your query exactly as is. Learn more.

Remove this alert.
Create another alert.
Manage your alerts.

PPPP/112

From: OST01 HOC
Sent: Thursday, April 21, 2011 11:49 AM
To: FOIA Response.hoc Resource
Subject: FW: e-version of draft of today's noon status update
Attachments: USNRC Earthquake-Tsunami Update 042111, 1200 EDT.docx

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From: LIA08 Hoc
Sent: Thursday, April 21, 2011 8:20 AM
To: RST01 Hoc; Hoc, PMT12; OST01 HOC
Subject: e-version of draft of today's noon status update

If you have a lot of updates, please add them to the attached and get it back to me by 10:30. Pen and ink changes by then are OK, too..

Thanks!

Clyde
Liaison Team Coordinator
US Nuclear Regulatory Commission
email: lia08.hoc@nrc.gov
Desk Ph: 301-816-5185

PPPP 1/13.

From: OST01 HOC
Sent: Friday, April 22, 2011 10:01 AM
To: Kokajko, Lawrence; RST01 Hoc; Hoc, PMT12; LIA08 Hoc
Subject: Draft One Pager 1500 (April 22, 2011)
Attachments: Japan One Pager 1500 EDT 4-22-11.doc

Good morning,

Here is a copy of the One-Pager that will need to be completed no later than 1:45pm today.

Thanks, EST

PPPP\114

Bano, Mahmooda

From: Scott, Michael
Sent: Friday, April 01, 2011 5:33 AM
To: 'nei-hisanori@meti.go.jp'
Cc: Casto, Chuck; Collins, Elmo; Monninger, John
Subject: "Cover Memo" for Rev 1 to the RST Assessment for Fukushima

Dear Nei-san:

The U.S. consortium asked me to pass on the below explanation for the revision to their earlier recommendations regarding containment flooding and venting. We can discuss these further at tomorrow's 11 am meeting if you wish.

Regards,

Mike Scott
USNRC

==========

1. For Unit 1, US government and their industry partners are concerned that the delay in establishing the ability to purge with nitrogen is significantly increasing the risk of a hydrogen combustion event within the primary containment. Such a combustion event could cause failure of the primary containment. US laboratories estimate that the concentration of combustible gases in primary containment may already be at combustible levels. Combustible gas concentrations continue to increase and the inerting effect of steam is diminishing due to condensation. Maintaining the primary containment intact is the top priority for unit 1. The US recommendation consists of three sets of actions which should be pursued in parallel since nitrogen purge capability is not available:

a. Maximize injection rates to the reactor pressure vessel to provide margin to core cooling and core retention within the reactor vessel. The US is concerned that injection at only the minimum debris retention rate may be insufficient to retain the core because some fraction of this water may be exiting the reactor pressure vessel without removing the core decay heat.

b. Venting will reduce both the inventory of combustible gasses and the starting pressure of the transient if a deflagration does occur. This will minimize the subsequent primary containment pressure spike thus reducing the probability of a primary containment break. The US recognizes that venting will lead to a release of radioactivity and will have some risk of a hydrogen combustion event external to the primary containment. However, the US considers that the consequence of the release is warranted at this time to protect the containment, and that the risk to containment of hydrogen combustion outside of primary containment is less than the risk of having an energetic hydrogen combustion event within the primary containment.

c. Flood the primary containment using a higher injection flowrate. The US recognizes that a more aggressive injection flowrate may increase the potential for a hydrogen combustion event within primary containment if venting is unsuccessful. However, the US considers it more important to have the drywell flooded, to at least the minimum debris submergence level (MDSL), which is the lowest primary containment water level at which it is expected that ex-vessel core debris on the drywell floor will be adequately submerged. The method to be used to flood primary containment should be selected to minimize the risk of a hydrogen combustion event; for example drywell sprays will rapidly condense steam that is believed to be inerting the atmosphere and hence should not be preferentially used.

PPPP/115

2. For Units 2 and 3, the assessment is revised to explicitly address the potential that primary containment may be currently breached and flood-up of containment to top of active fuel may be impractical.

From: LIA07 Hoc
Sent: Friday, April 01, 2011 10:05 PM
To: Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: One Pager - 2200 EDT, April 1
Attachments: April 1 2200 EDT one pager.docx

The 2200 EDT, April 1, 2011 "One Pager" is attached.
Please contact the ET with any questions.
-Sara

PPPP/116

From:	Schwartzman, Jennifer
To:	Doane, Margaret
Cc:	Jones, Andrea; Brenner, Eliot
Subject:	RE: DRAFT Remarks for Chairman
Date:	Saturday, April 02, 2011 8:26:18 AM
Attachments:	Draft Chairman Speech for Monday Night - Jen edits.docx

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Hi guys,
I'm sorry -I was not in the ops center last night, it was Charlotte's shift, so I wasn't able to do this when Andrea wrote to ask. I just got to the computer and have input the changes i suggested last night into Susan's text. Let me know if there is anything else I can do - I am happy to help anyway I can.

From: Brenner, Eliot
Sent: Saturday, April 02, 2011 6:00 AM
To: Doane, Margaret; Loyd, Susan
Cc: Marshall, Michael; Schwartzman, Jennifer; Jones, Andrea
Subject: RE: DRAFT Remarks for Chairman

Just fyi, I am available to assist where I can. Two problems: NRC laptop gives new meaning to term dysfunctional, and for the moment my blackberry/phone service is dead. Trying to find someone in the tech arena back in DC to help me work through that.

From: Doane, Margaret
Sent: Saturday, April 02, 2011 5:58 AM
To: Loyd, Susan; Brenner, Eliot
Cc: Marshall, Michael; Schwartzman, Jennifer; Jones, Andrea
Subject: Re: DRAFT Remarks for Chairman

Susan,
I know that everyone has a lot on their plate. I want to work together to make this a success. I'm very concerned with getting this presentation out of process and then missing key insights. This is a 10-15 minute presentation. It is not a bilat or meeting for which OIP produces talking points.
To me this needs to continue to benefit from the normal Chmn. speech writing process. OIP can give an international perspective, but as the Chairman has been doing many presentations on this topic, which we were neither present nor involved, there is good reason to keep it under the Chmn's speech writing arm for consistency.
At the same time we're happy to help. If you guys agree with Jen's suggestion, please suggest edits or we can suggest edits. I showed Jen's insights to Eliot. He'd like to see them written, but generally he agrees. Definitely the presentation needs to have an international tone.
I don't have the text it didn't come through, but I'd like to see the message that we intend to work with the international community to share insights, etc. on lessons learned, if that's not covered. We can print out a new version in Vienna. But I'd like to get the text to Michael for the Chmn. to read on the plane.
Thanks,
Margie

Sent from an NRC Blackberry
Margaret Doane

From: Loyd, Susan
To: Doane, Margaret; Brenner, Eliot
Cc: Marshall, Michael

PPPP 117

Sent: Fri Apr 01 16:29:59 2011
Subject: RE: DRAFT Remarks for Chairman

Margie:
I am not aware that he is giving an actual speech?! Here are the brief remarks I have prepared (about 7 min), and he may need to add or subtract as appropriate, given how the event evolves. Am not sure about including the paragraph on the 50 mile evacuation, although that is sure to be questioned....I thought he may as well own that right up front and explain the rationale. You may think otherwise.

These are largely drawn from the Congressional testimonies I prepared for him over the past two weeks, so the language is somewhat vetted already.
Susan

Susan K. Loyd
Communications Director
Office of the Chairman
U.S. Nuclear Regulatory Commission
Tele: 301-415-1838
Susan.Loyd@nrc.gov

From: Doane, Margaret
Sent: Friday, April 01, 2011 4:03 PM
To: Brenner, Eliot; Loyd, Susan
Cc: Marshall, Michael
Subject: Re: DRAFT Remarks for Chairman

Who is writing his speech for Mon. evening?

Sent from an NRC Blackberry
Margaret Doane

From: Brenner, Eliot
To: Loyd, Susan; Doane, Margaret
Sent: Fri Apr 01 15:15:53 2011
Subject: RE: DRAFT Remarks for Chairman

Thanks. I also grabbed the press release on the task force to steal from

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From: Loyd, Susan
Sent: Friday, April 01, 2011 3:08 PM
To: Brenner, Eliot; Doane, Margaret
Subject: DRAFT Remarks for Chairman

Eliot and Margie:
I am attaching some remarks I have drafted that the Chairman could use if he ends up being asked to speak briefly at a press event or a Japan-related event. These are based on the Congressional testimonies I drafted for him, so the language is pretty well vetted. He could add/subtract comments as appropriate, as plans evolve. It should be about 7 minutes.

I have circulated these to a couple of our staff here, but don't know if I'll get feedback or not. This is an FYI. Have a good trip!
Susan

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Tele: 301-415-1838
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TALKING POINTS FOR CNS MONDAY MEETING RE: JAPAN

I would like to reiterate my condolences to all those who have been affected by the earthquake and tsunami in Japan. Our hearts go out to all who have been dealing with the aftermath of these natural disasters, and we are mindful of the long and difficult road they will face in recovering. We know that the people of Japan are resilient and strong, and we have every confidence that they will come through this terrible time and move forward, with resolve, to rebuild their vibrant country.

I made a brief visit to Japan last week. I wanted to convey a message of support and cooperation to our Japanese counterparts there and to assess the ongoing situation. I also met with senior Japanese government and TEPCO officials, and consulted with a team of experts from the U.S. Nuclear Regulatory Commission who went to Japan as part of our assistance effort.

NRC Response to Japan Events

I'd like to take a few minutes to address the response of the NRC to the tragic events in Japan, and then to briefly describe how we plan to proceed.

On Friday, March 11, when the earthquake and tsunami struck, the NRC's headquarters Operations Center began operating on a 24-hour basis to monitor and analyze events at nuclear power plants in Japan. At the request of the Japanese government, and through the United States Agency for International Development (USAID), the NRC sent a team of its technical experts to provide on-the-ground support, and we have been in continual contact with them since that time. And, within the United States, the NRC has been working closely with other Federal agencies as part of our government's response to the situation.

Shortly after 4:00 AM (Washington, DC time) on Friday, March 11th, the NRC Emergency Operations Center made the first telephone call to inform NRC management of the

earthquake and the potential impact on U.S. plants. We went into monitoring mode at our Emergency Operations Center, and the NRC's first concern was possible impacts of the tsunami on U.S. plants and radioactive materials on the West Coast, and in Hawaii, Alaska, and U.S. Territories in the Pacific.

We were in communication with our licensees and our resident inspectors at Diablo Canyon Power Plant and San Onofre Nuclear Generating Station in California, and the Radiation Control Program Directors for California, Washington, Oregon and Hawaii.

On that same day, we began interactions with our Japanese regulatory counterparts and dispatched two experts to Japan to help at the embassy in Tokyo.

By Monday, March 14, we had dispatched a total of 11 NRC staff to Japan. We have subsequently rotated in additional staff to continue on-the-ground assistance in Japan. The areas of focus for this team are: 1) to assist the Japanese government and respond to requests from our Japanese regulatory counterparts; 2) to support the U.S. Ambassador and the U.S. government assistance effort.

On Wednesday, March 16, we collaborated with other U.S. government agencies and decided to advise American citizens to evacuate within a 50-mile range around the plant. We believed this decision was a prudent course of action, and would be consistent with what we would do in a similar situation in the United States. This evacuation range was predicated on the information that we had available at the time, which indicated the possibility that reactor cores and spent fuel pools may have been compromised.

We have been working with an extensive range of stakeholders regarding the Japan situation, including the White House, Congressional staff, our state regulatory counterparts, a number of other federal agencies, and the international regulatory bodies around the world.

Steps Already Taken

The NRC's program of continuous improvement in the future will include lessons learned from the events in Japan. We already have begun enhancing inspection activities through temporary instructions to our inspection staff, including the resident inspectors and the inspectors in our four Regional offices.

We've also issued an information notice to licensees to make them aware of activities they should undertake to verify that their capabilities to mitigate conditions due to severe accidents—including the loss of significant operational and safety systems—are in effect and operational. Specific conditions include a total loss of electric power, flooding, and damage from seismic events.

On their own initiative, the Institute of Nuclear Power Operations (INPO) issued a Level I Event Report (highest level) to its members on March 15, identifying four actions requiring written responses. Those include walkdowns and verifications of capabilities to address large fires and explosions; severe accident management guidelines; mitigation of station blackout conditions; internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event.

NRC Plans Moving Forward

While we are confident about the safety of U.S. nuclear power plants, our regulatory agency has a responsibility to the American people to undertake a systematic and methodical review of the safety of our domestic facilities, in light of the natural disaster and the resulting nuclear situation in Japan. Examining all available information is an essential part of that effort.

On March 21, my fellow Commissioners and I established a senior level task force to conduct a comprehensive review of our processes and regulations to determine whether the agency should make improvements to our regulatory system.

This review will be conducted in a short-term and a longer-term timeframe. The short-term review has already begun, and will identify potential or preliminary near-term operational or regulatory issues. A longer-term review will begin as soon as we have sufficient information from Japan. That review will be completed in six months from the beginning of the evaluation. The task force's reports will be publicly available.

The task force will evaluate all technical and policy issues related to the event 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 also expect to evaluate ~~potential interagency~~ issues that may involve multiple U.S. Government agencies, such as emergency preparedness. We ~~expect to~~will seek input from all key stakeholders during this process.

Formatted: cm5, Right: 0.14", Don't adjust space between Latin and Asian text

Based on what we learn in our review, we will take all of the appropriate actions that are necessary to ensure the continuing safety of the American people.

We will also continue to communicate closely with our regulatory counterparts throughout this process. As we navigate lessons-learned efforts in the months ahead, international cooperation takes on new importance. The IAEA has a significant role to play in facilitating information-sharing among countries as we undertake this process. To that end, we commend Director General Amano's announcement of the Agency's intention to host a ministerial-level conference in June. We are also pleased to support the IAEA as it works to address the events at Fukushima into its activities in various technical disciplines, as well as continuing its work in areas that have already been identified as nuclear safety and security priorities.

Over the next few days, contracting parties to the Convention on Nuclear Safety will have the opportunity to present information on their nuclear safety programs and receive feedback from their counterparts. This review process provides us with an important venue to

address the events in Japan and begin to formulate plans for short- and long-term cooperation. But in addition, it continues to serve a critical purpose in generally advancing nuclear safety worldwide. We are pleased to be part of this process.

We commend the IAEA staff for its hard work in preparing for the Convention review meeting and continuing to facilitate the provision of assistance to the Japanese people. I appreciate the opportunity to address you this evening.

From:	LIA07 Hoc
To:	LIA07 Hoc
Subject:	0430 EDT (April 2, 2011) USNRC Earthquake/Tsunami Status Update
Date:	Saturday, April 02, 2011 5:24:06 AM
Attachments:	NRC Status Update 4.2.11--0430.pdf

Attached, please find a 0430 EDT, April 2, 2011 status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

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

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

-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

PPPP/118

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - Nuclear Regulatory Commission
Date: Saturday, April 02, 2011 4:49:13 AM

News **4** new results for **Nuclear Regulatory Commission**

PSEG reactors pass **NRC** reviews

NJ.com

The **Nuclear Regulatory Commission** has completed its environmental and safety reviews of license renewal applications submitted by PSEG Nuclear for its three reactors here and finds no issues that would preclude allowing the plants to operate for an **...**

See all stories on this topic »

Fort Calhoun violations listed

Omaha World-Herald

By Nancy Gaarder On Friday — April Fools' Day, no less — the **Nuclear Regulatory Commission** posted its daily log of problems reported by nuclear facilities around the country. Two of the five items logged involved Fort Calhoun Nuclear Station, **...**

See all stories on this topic »

Japan crisis spurs Calif. senators to action

San Diego News Room

The senators also sent a letter to US **Nuclear Regulatory Commission** (**NRC**) Chair Gregory Jaczko, requesting inspections of California's nuclear plants, the San Onofre nuclear power plant in San Clemente and Diablo Canyon in San Luis Obispo, **...**

See all stories on this topic »

150 protesters rally against nuke plant

Pueblo Chieftain

Paul Wright of Avondale said the commissioners only need to focus on the fact that the federal **Nuclear Regulatory Commission** requires all power plants to keep the highly radioactive spent fuel rods on site. "So the question is, do you want a nuclear **...**

See all stories on this topic »

PPPP/119

From:	Susan Loyd
To:	Schwartzman, Jennifer; Loyd, Susan; Brenner, Eliot; Doane, Margaret; Marshall, Michael; Jones, Andrea; Warren, Roberta; Coggins, Angela; Batkin, Joshua
Subject:	Revised Remarks for Monday Night
Date:	Saturday, April 02, 2011 9:33:13 AM
Attachments:	Speech for Monday Night (2) -TEXT.docx Speech for Monday Night (2) BULLETS.docx

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Here are clean copies of the text and bullets. The paragraph that is in question is in the middle, regarding the 50-mile evacuation decision. I will leave that up to you to discuss with the Chairman and decide if you want to delete it or not. There are several sentences that are involved. This is about 11 minutes, at his usual speaking speed.

Eliot - I will copy the new text version into the body of an email and send to you. Thanks everyone!
Susan

PPPP/120

PREPARED REMARKS FOR CNS MONDAY MEETING

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- I appreciate the opportunity to address you this evening.

From: Susan Loyd
To: Brenner, Eliot
Subject: Monday Night Remarks - Text
Date: Saturday, April 02, 2011 9:41:27 AM

PREPARED REMARKS FOR CNS MONDAY MEETING

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PPPP/12

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From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - Nuclear Regulatory Commission
Date: Saturday, April 02, 2011 12:30:02 AM

News **2** new results for **Nuclear Regulatory Commission**

NRC to discuss safety at Cordova plant
Quad City Times
In the wake of Japan's nuclear plant problems caused by last month's tsunami, organizers of a meeting to discuss the safety record of Exelon Nuclear Quad-Cities Station expect more interest than in the past. The **Nuclear Regulatory Commission**, or **NRC**, **...**
See all stories on this topic »

OPPD reports finding 2 small openings in the flood barrier around Fort Calhoun **...**
Greenfield Daily Reporter
Utility officials told the **Nuclear Regulatory Commission** they discovered the two 4-inch conduits uncovered on Thursday. OPPD spokesman Jeff Hanson said the electrical conduits were plugged up Friday morning. The pipes carry electrical wires into a **...**
See all stories on this topic »

Tip: Use a minus sign (-) in front of terms in your query that you want to exclude. Learn more.

Remove this alert.
Create another alert.
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PPPP/122

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - Nuclear Regulatory Commission
Date: Saturday, April 02, 2011 2:14:07 PM

Blogs **5** new results for **Nuclear Regulatory Commission**

Riverkeepers Top Ten Reasons To Close Indian Point!! - Green ...
By Green Living Guy
The United States **Nuclear Regulatory Commission** ("**NRC**") revised its estimates of earthquake risk in 2010, concluding that Indian Point is the most likely nuke plant in the nation to experience core damage due to an earthquake. ...
Green Living - http://www.greenlivingguy.com/

NRC panel OKs arguments on nuclear fuel plant | Local | Aiken ...
The panel is an independent judicial agency within the U.S. **Nuclear Regulatory Commission**. The **NRC** is responsible for deciding whether to give the plant permission to operate. Lou Zeller, science director of the Blue Ridge Environmental ...
Local News | The Aiken Standard - http://www.aikenstandard.com/local/

NRC: 3 U.S. Nuclear Plants Need Increased Oversight - Care2 News ...
By Cal Mendelsohn
The **Nuclear Regulatory Commission** says three U.S. nuclear power plants need increased oversight from federal regulators, although officials stressed that all are operating safely.
Care2 News Network - http://www.care2.com/news/

When man does not bite dog is news
By djysrv
So when the New York Times writes that U.S. nuclear utilities are complying with requirements from the **Nuclear Regulatory Commission** (**NRC**) regarding the control hydrogen in reactor pressure vessels, why is that news? ...
Idaho Samizdat: Nuke Notes - http://djysrv.blogspot.com/

The Dangers of US Spent **Nuclear** Fuel
By The Real News
The response by the **Nuclear Regulatory Commission** and the nuclear industry was hostile, and they issued a lot of criticisms to our report. And it generated enough controversy at the time that the United States Congress asked the ...
Pacific Free Press RSS - http://www.pacificfreepress.com/

PPPP/123

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - Nuclear Regulatory Commission
Date: Saturday, April 02, 2011 3:55:14 PM

News **1** new result for **Nuclear Regulatory Commission**

US studies Fukushima disaster for safety lessons
AFP
Two of the plant's six spent fuel rod pools were apparently damaged following the quake and tsunami, said Gregory Jaczko, head of the US **Nuclear Regulatory Commission** (**NRC**). "It was possible there was a leak," he told a US Senate hearing on March 30, **...**
See all stories on this topic »

AFP

Tip: Use quotes ("like this") around a set of words in your query to match them exactly. Learn more.

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PPPP/124

From: Weber, Michael
To: LIA06 Hoc; LIA08 Hoc
Cc: Brenner, Eliot; Hayden, Elizabeth; Ellmers, Glenn; Nelson, Robert
Subject: FYI - GOOD SITE FOR HIGH RESOLUTION PHOTOS OF FUKUSHIMA
Date: Saturday, April 02, 2011 5:02:10 PM

In case you are looking for a good site for high resolution photographs of the damaged Fukushima-Daiichi NPPs, you might find this site handy...
http://cryptome.org/eyeball/daiichi-npp/daiichi-photos.htm

PRPD/125

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - Nuclear Regulatory Commission
Date: Saturday, April 02, 2011 5:52:16 PM

Web **1** new result for **Nuclear Regulatory Commission**

NRC NEWS
The **Nuclear Regulatory Commission** has named six senior managers and staff to its **...** The task force will be led by Dr. Charles Miller, Director of the **NRC's ...**
www.nrc.gov/reading-rm/doc-collections/news/.../11-062.pdf

Tip: Use site restrict in your query to search within a site (site:nytimes.com or site:.edu). Learn more.

Remove this alert.
Create another alert.
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PPPP/126

From:	LIA07 Hoc
To:	LIA07 Hoc
Subject:	1800 EDT (April 2, 2011) USNRC Earthquake/Tsunami Status Update
Date:	Saturday, April 02, 2011 6:19:09 PM
Attachments:	USNRC Earthquake-Tsunami Update.040211.1800EDT.pdf

---

Attached, please find a 1800 EDT, April 2, 2011 status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

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

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

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

PPPP|127

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - jaczko
Date: Saturday, April 02, 2011 7:33:24 PM

News **1** new result for **jaczko**

US studies Fukushima disaster for safety lessons
AFP
Two of the plant's six spent fuel rod pools were apparently damaged following the quake and tsunami, said Gregory **Jaczko**, head of the US Nuclear Regulatory Commission (NRC). "It was possible there was a leak," he told a US Senate hearing on March 30, **...**
See all stories on this topic »

AFP

Tip: Use a plus sign (+) to match a term in your query exactly as is. Learn more.

Remove this alert.
Create another alert.
Manage your alerts.

PPPP/128

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - Nuclear Regulatory Commission
Date: Saturday, April 02, 2011 7:31:08 PM

News **1** new result for **Nuclear Regulatory Commission**

Will there be a **nuclear** meltdown in your backyard?
Daily Caller
Because the **Nuclear Regulatory Commission** (**NRC**) says the GE-designed reactors in Fukushima have 23 sisters in the United States. What happened in Japan could happen here. The **NRC** database of nuclear power plants shows that 23 of the 104 nuclear power **...**
See all stories on this topic »

Daily Caller

Tip: Use a minus sign (-) in front of terms in your query that you want to exclude. Learn more.

Remove this alert.
Create another alert.
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PPPP/129

From: Mamish, Nader
To: Weber, Michael
Cc: LIA06 Hoc; LIA08 Hoc; Brenner, Eliot; Schmidt, Rebecca; Boger, Bruce; Thaggard, Mark; Muessle, Mary; Andersen, James; Leeds, Eric; Haney, Catherine; Sheron, Brian; Johnson, Michael; Virgilio, Martin; Doane, Margaret
Subject: RE: QUERY - CSIS INVITATION: Nuclear Safety After Fukushima
Date: Saturday, April 02, 2011 8:34:15 PM

I'm checking on the staff's availability .

Thanks

From: Weber, Michael
Sent: Friday, April 01, 2011 4:49 PM
To: Doane, Margaret; Mamish, Nader
Cc: LIA06 Hoc; LIA08 Hoc; Brenner, Eliot; Schmidt, Rebecca; Boger, Bruce; Thaggard, Mark; Muessle, Mary; Andersen, James; Leeds, Eric; Haney, Catherine; Sheron, Brian; Johnson, Michael; Virgilio, Martin
Subject: QUERY - CSIS INVITATION: Nuclear Safety After Fukushima

Does OIP want to take the lead in participating in this seminar for NRC? Someone should attend, listen, and share highlights back here to the rest of our team. If OIP cannot support, please advise.

From: CSIS Proliferation Prevention Program [mailto:tspitzer-hobeika@csis.org]
Sent: Friday, April 01, 2011 4:11 PM
To: Weber, Michael
Subject: CSIS INVITATION: Nuclear Safety After Fukushima

To ensure receipt of our email, please add us to your address book.

The CSIS Proliferation Prevention Program invites you to a timely discussion on:

Nuclear Safety After Fukushima

The March 11, 2011 earthquake and tsunami have had a devastating effect on Japan. The impact has been magnified by the crisis at the Fukushima Daiichi nuclear power plant, where efforts continue to contain radiation from damaged reactors and spent fuel pools. Beyond the inevitable questions posed by the media in the midst of the crisis, national and international authorities will be reviewing safety regulations and their implementation. The U.S. Congress has already held several hearings and the International Atomic Energy Agency Director Yukiya Amano has called for a nuclear safety summit in June.

The CSIS Proliferation Prevention Program is pleased to bring two expert panels together to analyze the current situation and its impact on U.S. and international nuclear safety.

Thursday, April 7, 2011
from 2:00pm to 5:00pm
B1 Conference Center

PPPP/13D

CSIS, 1800 K Street NW, Washington, DC 20006

Speakers:

Opening Remarks: Dr. John Hamre, President, Center for Strategic and International Studies
Moderator: Ms. Sharon Squassoni, Director, CSIS Proliferation Prevention Program

2:15-3:45: National Responses
Mr. Alex Flint, Senior Vice President for Governmental Affairs, Nuclear Energy Institute (Invited)
Ms. Ellen Vancko, Nuclear Energy and Climate Change Project Manager, Union of Concerned Scientists
Mr. Mark Holt, Specialist in Energy Policy, Congressional Research Service

3:45-5:00: International Responses
Dr. Olli Heinonen, Senior Fellow, Belfer Center for Science and International Affairs, Harvard Kennedy School
Mr. Carlton Stoiber, Chair of the Nuclear Security Working Group, International Nuclear Law Association
Ms. Carol Kessler, Chair of the Nonproliferation and National Security Department, Brookhaven National Laboratory

Please **RSVP** to Ms. Tamara Spitzer-Hobeika at tspitzer-hobeika@csis.org or 202.775.3239.

From: Google Alerts
To: Brenner, Eliot
Subject: Google Alert - Nuclear Regulatory Commission
Date: Saturday, April 02, 2011 11:27:01 PM

News **1** new result for **Nuclear Regulatory Commission**

Disaster fuels debate over **nuclear** accident evacuation plans
MiamiHerald.com
The disaster in Japan, followed by the US **Nuclear Regulatory Commission** urging Americans to evacuate within 50 miles of the Fukushima Daiichi reactors, has sparked calls to reassess emergency plans for the nation's 65 nuclear plants. ...
See all stories on this topic »

MiamiHerald.com

Tip: Use a minus sign (-) in front of terms in your query that you want to exclude. Learn more.

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PPPP/131

From: OST01 HOC
Sent: Friday, April 22, 2011 4:14 PM
To: Kokajko, Lawrence; Batkin, Joshua; Boger, Bruce; Carpenter, Cynthia; Castleman, Patrick; Franovich, Mike; Gibbs, Catina; Hipschman, Thomas; Hoc, PMT12; Jaczko, Gregory; Johnson, Michael; LIA08 Hoc; Marshall, Michael; Moore, Scott; Orders, William; Pace, Patti; RST01 Hoc; Snodderly, Michael; Speiser, Herald; Tracy, Glenn; Uhle, Jennifer; Virgilio, Martin; Weber, Michael; Wiggins, Jim; Zimmerman, Roy
Subject: Japan One Pager 1500 EDT 4-22-11
Attachments: Japan One Pager 1500 EDT 4-22-11 .pdf

Please note all attachments are OUO

Attached, please find the April 22- 1500 EDT One-Pager - Fukushima Daiichi

Please note all attachments are ~~OUO~~

PPPD/132

Bano, Mahmooda

From: Hochevar, Albert R. (INPO) [HochevarAR@INPO.org]
Sent: Saturday, April 02, 2011 8:20 PM
To: blamey.allen@nrc.gov; Scott, Michael; Giessner, John
Subject: FW:
Attachments: Areva 51564602-Fukuchima-Eng-20110320.pdf

All

For your information. Here is the Areva speculation regarding the possible status of the reactors. Received from Shaw member of IST Tokyo.

Al

PPPP/133

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The Fukushima Daiichi Incident

1. Plant Design
2. Accident Progression
3. Radiological releases
4. Spent fuel pools
5. Sources of Information

Matthias Braun
PEPA4-G, AREVA–NP GmbH
Matthias.Braun@AREVA.com

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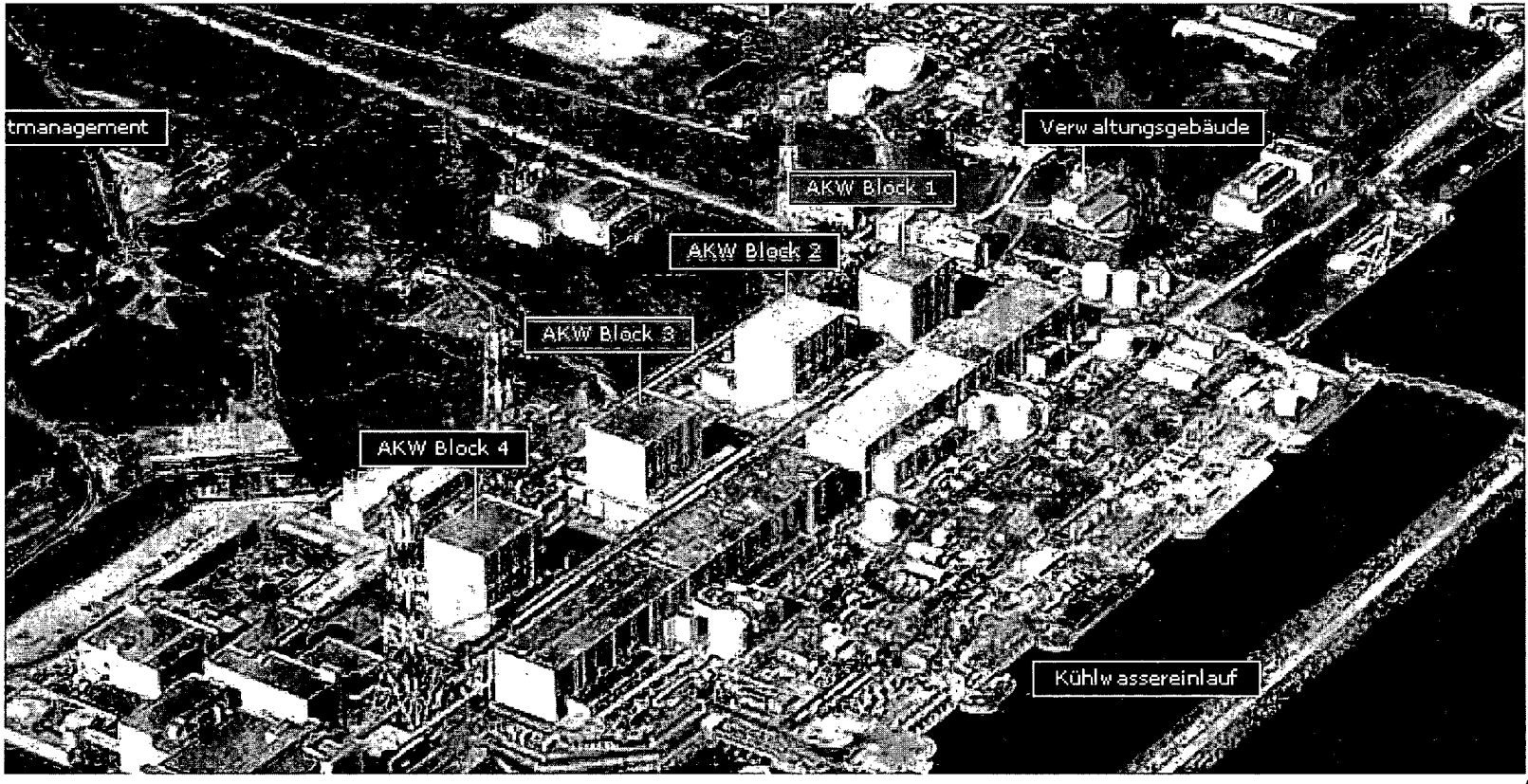
The Fukushima Daiichi Incident
1. Plant Design

- **Fukushima Daiichi (Plant I)**
  - **Unit I - GE Mark I BWR (439 MW), Operating since 1971**
  - **Unit II-IV - GE Mark I BWR (760 MW), Operating since 1974**



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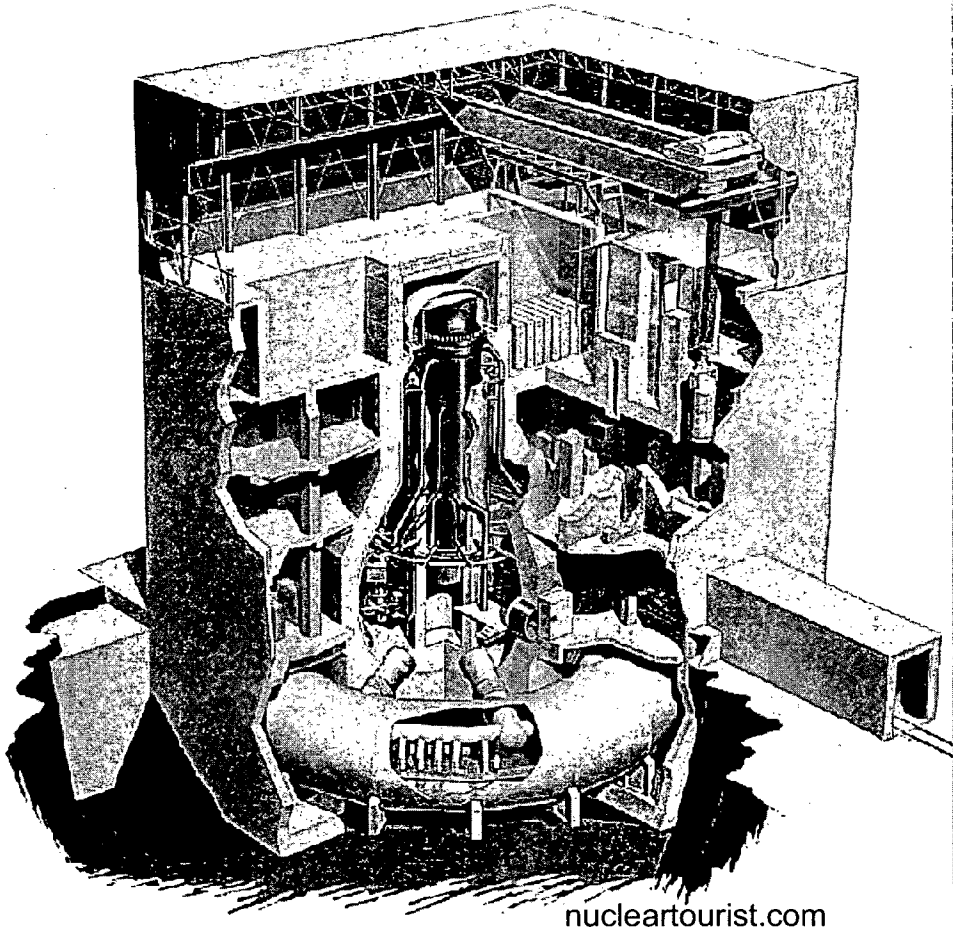
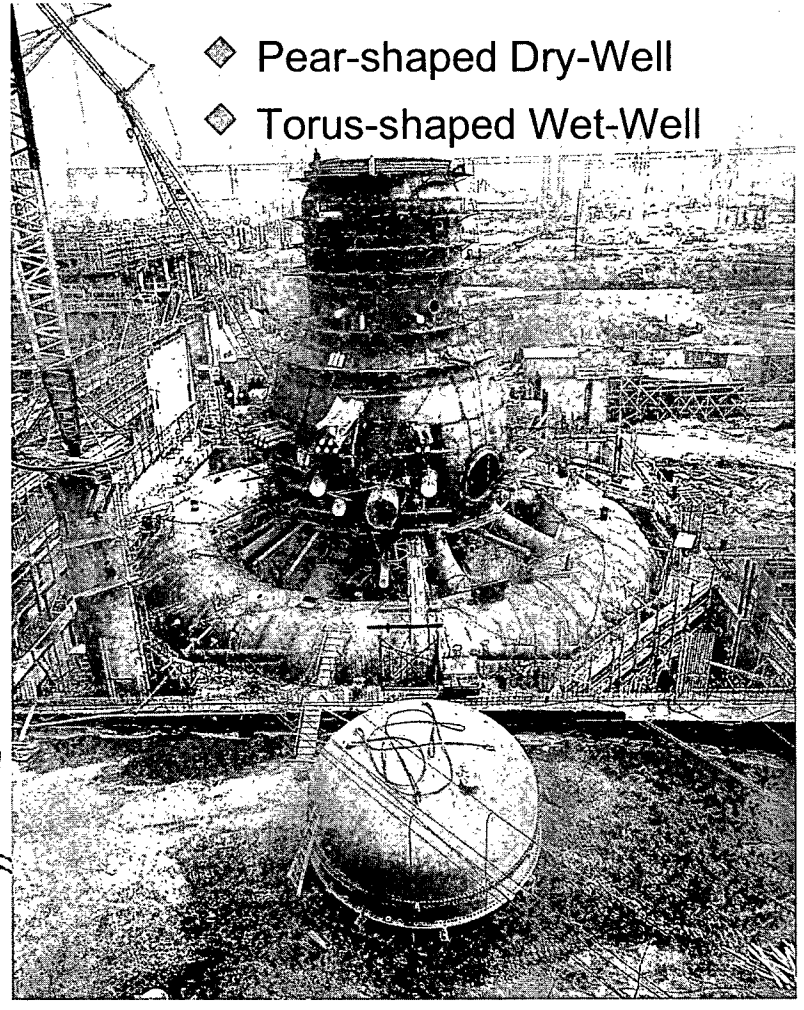
The Fukushima Daiichi Incident
1. Plant Design

- Building structure
  - Concrete Building
  - Steel-framed Service Floor



nucleartourist.com

- Containment
  - Pear-shaped Dry-Well
  - Torus-shaped Wet-Well



en.wikipedia.org/wiki/Browns_Ferry_Nuclear_Power_Plant

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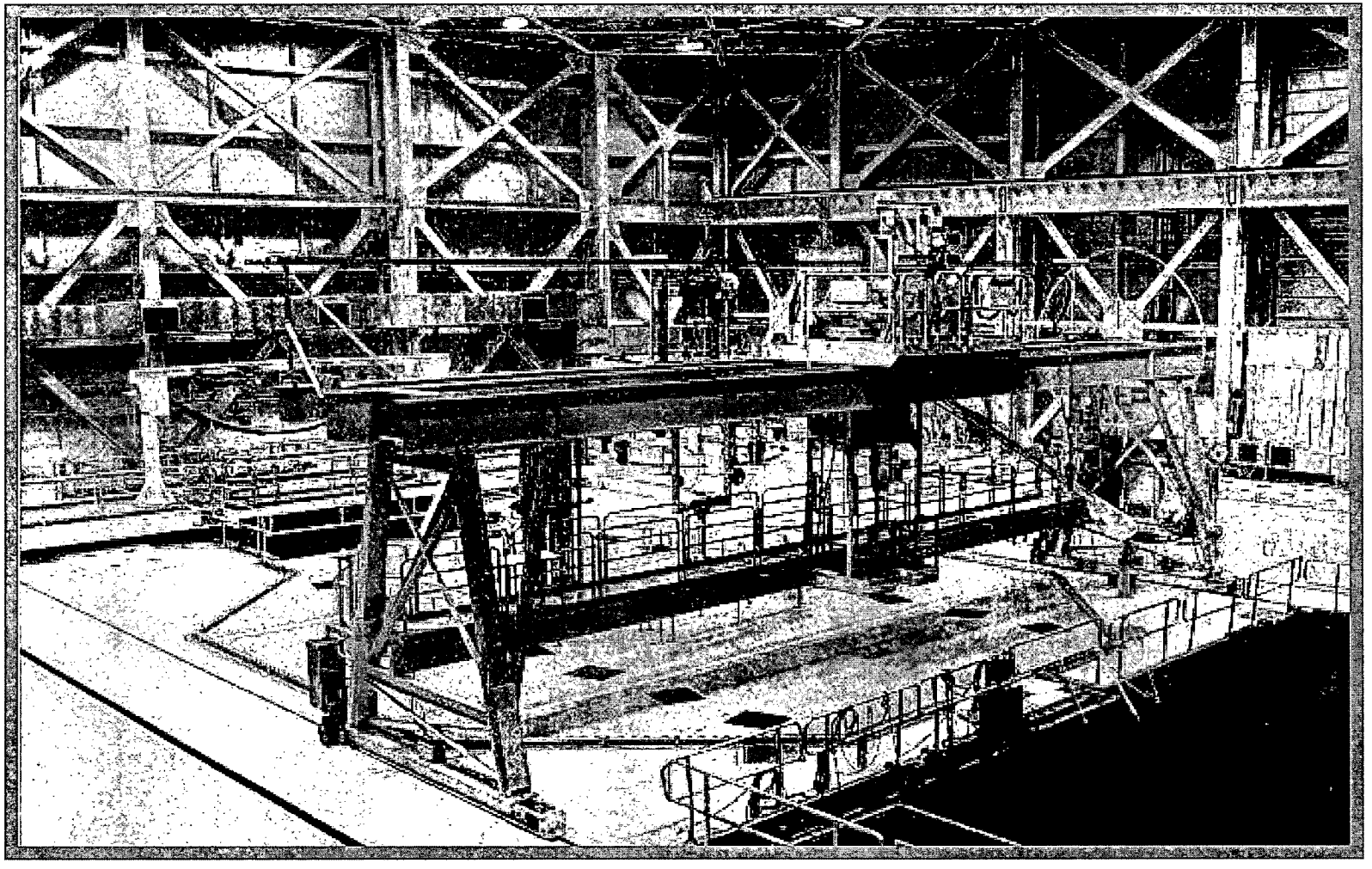
The Fukushima Daiichi Incident
1. Plant Design

- Service Floor



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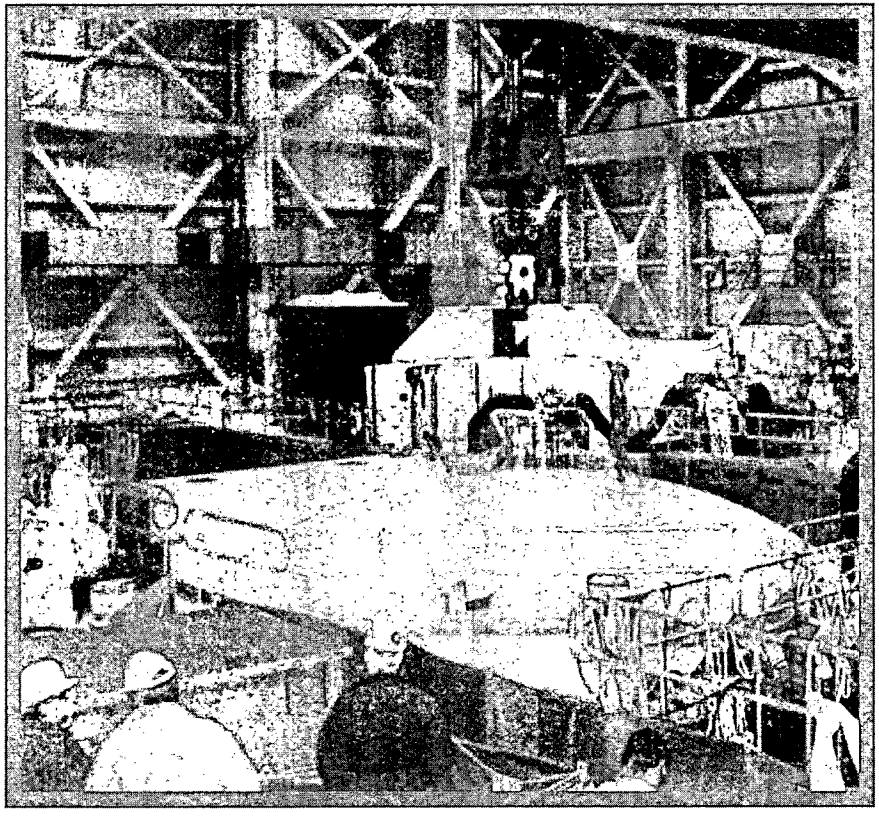
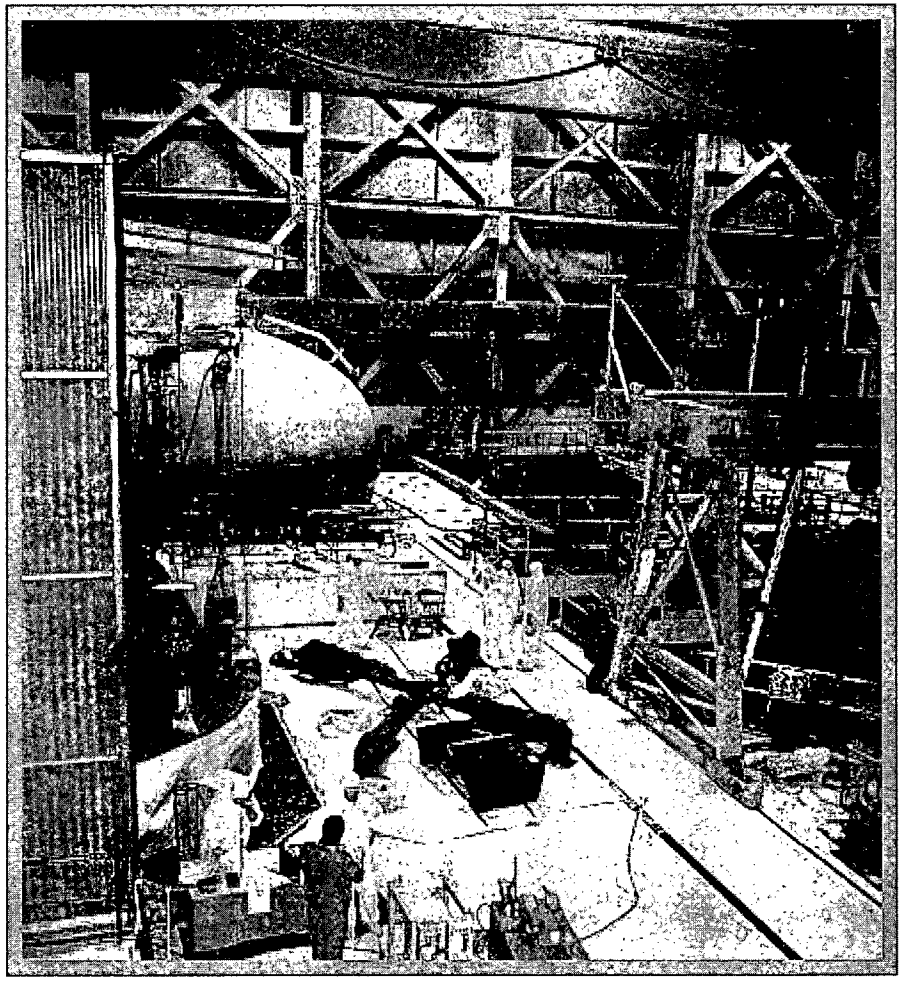
The Fukushima Daiichi Incident
1. Plant Design

- Lifting the Containment closure head





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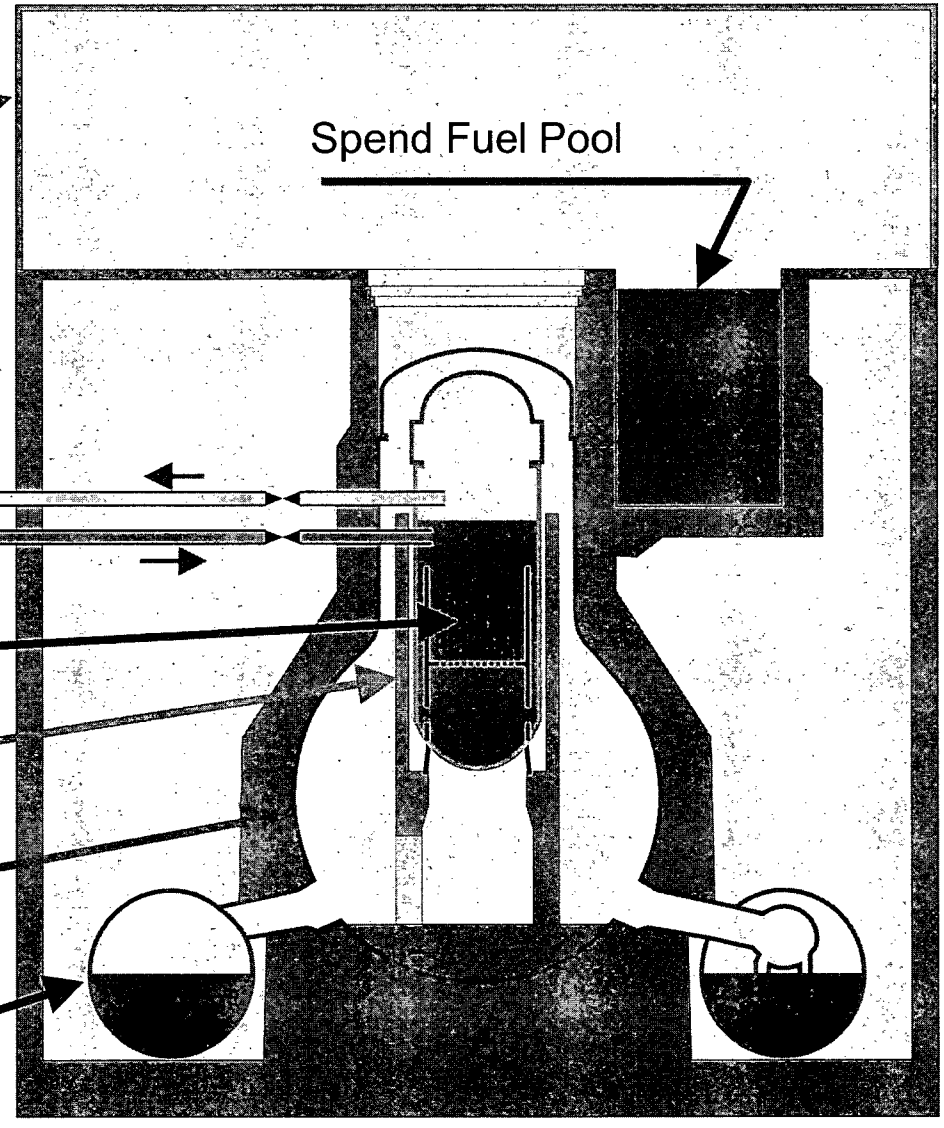
The Fukushima Daiichi Incident
1. Plant Design

- Reactor Service Floor (Steel Construction)
- Concrete Reactor Building (secondary Containment)
- Reactor Core
- Reactor Pressure Vessel
- Containment (Dry well)
- Containment (Wet Well) / Condensation Chamber



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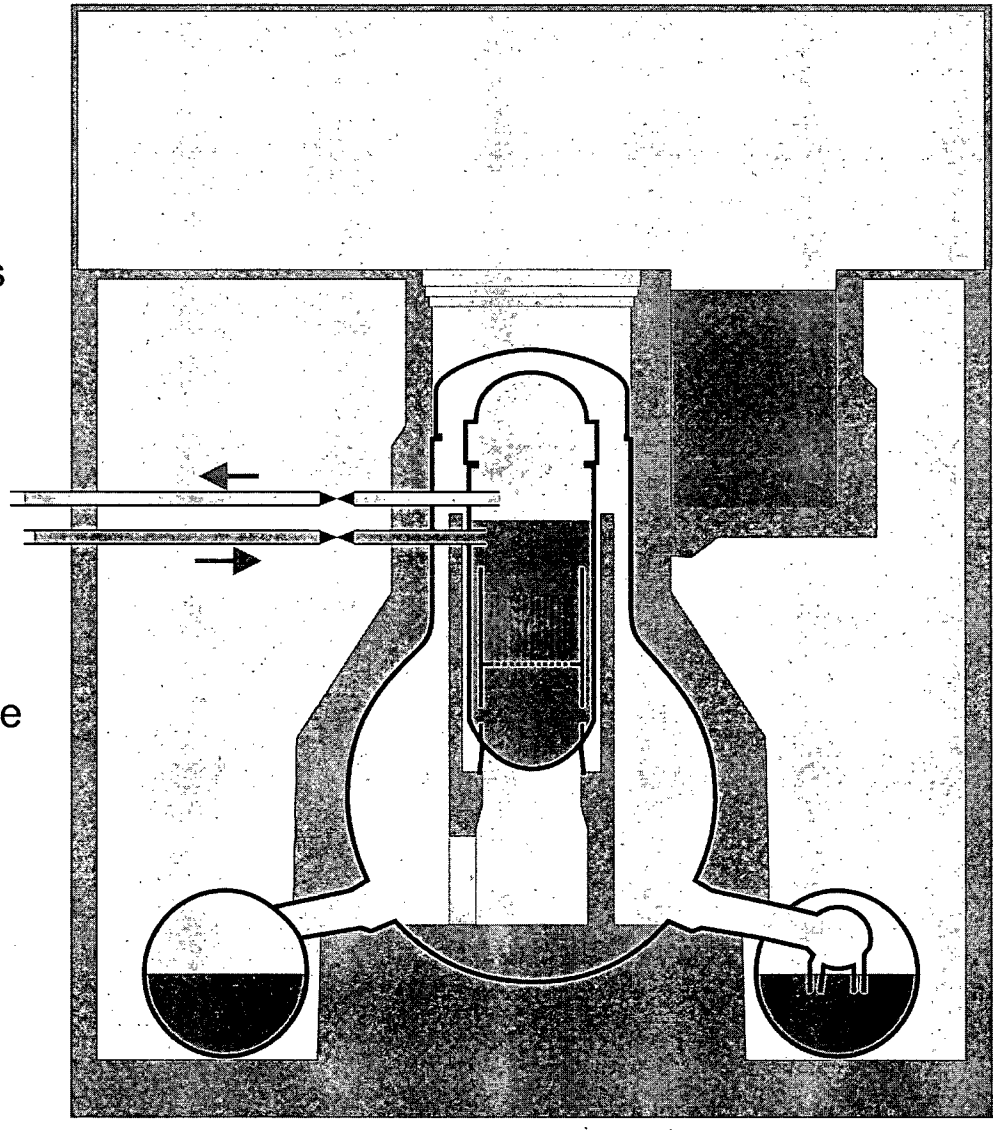
The Fukushima Daiichi Incident

2. Accident progression

- 11.3.2011 14:46 - Earthquake
  - Magnitude 9
  - Power grid in northern Japan fails
  - Reactors itself are mainly undamaged
- SCRAM
  - Power generation due to Fission of Uranium stops
  - Heat generation due to radioactive Decay of Fission Products
    - After Scram ~6%
    - After 1 Day ~1%
    - After 5 Days ~0.5%



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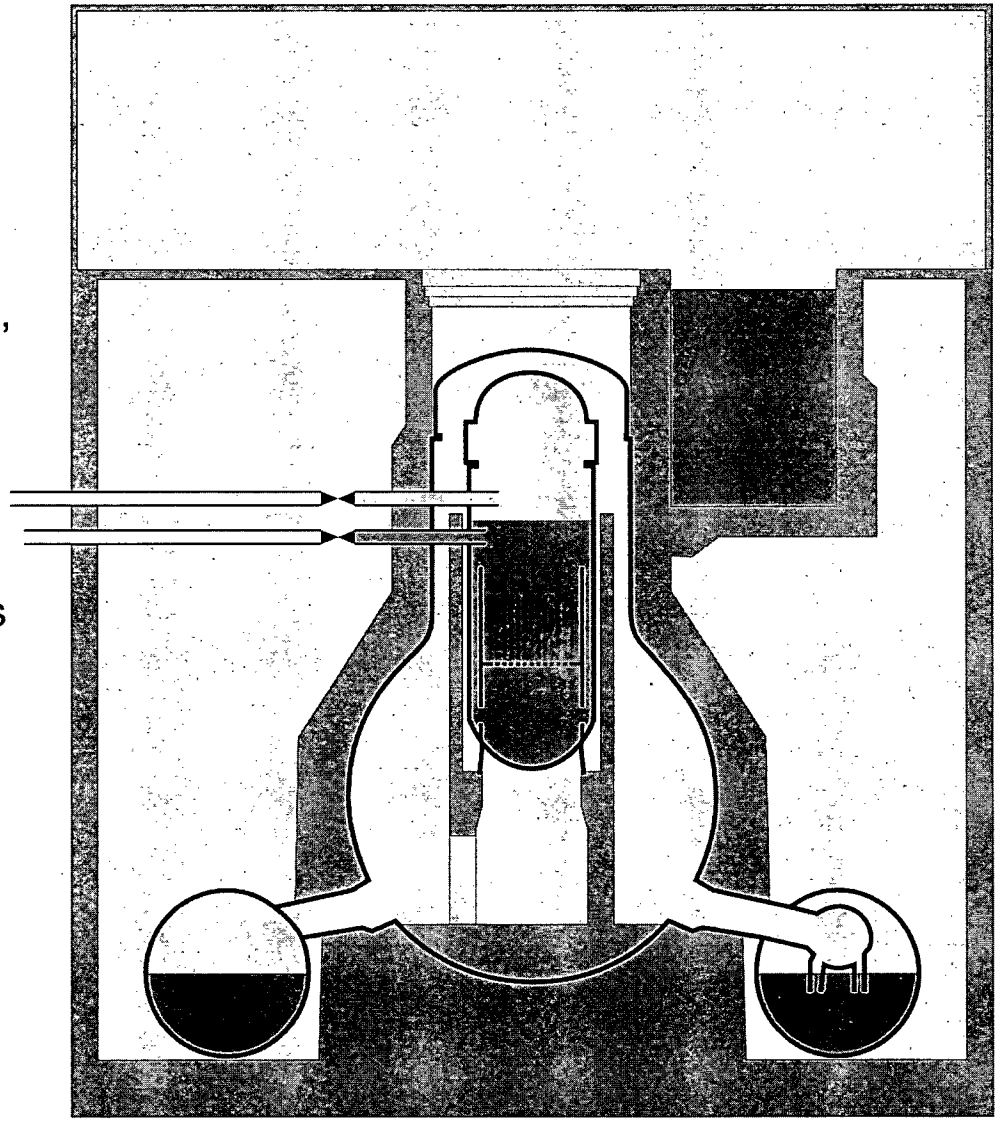
The Fukushima Daiichi Incident

2. Accident progression

- Containment Isolation
  - Closing of all non-safety related Penetrations of the containment
  - Cuts off Machine hall
  - If containment isolation succeeds, a large early release of fission products is highly unlikely
- Diesel generators start
  - Emergency Core cooling systems are supplied
- Plant is in a stable save state



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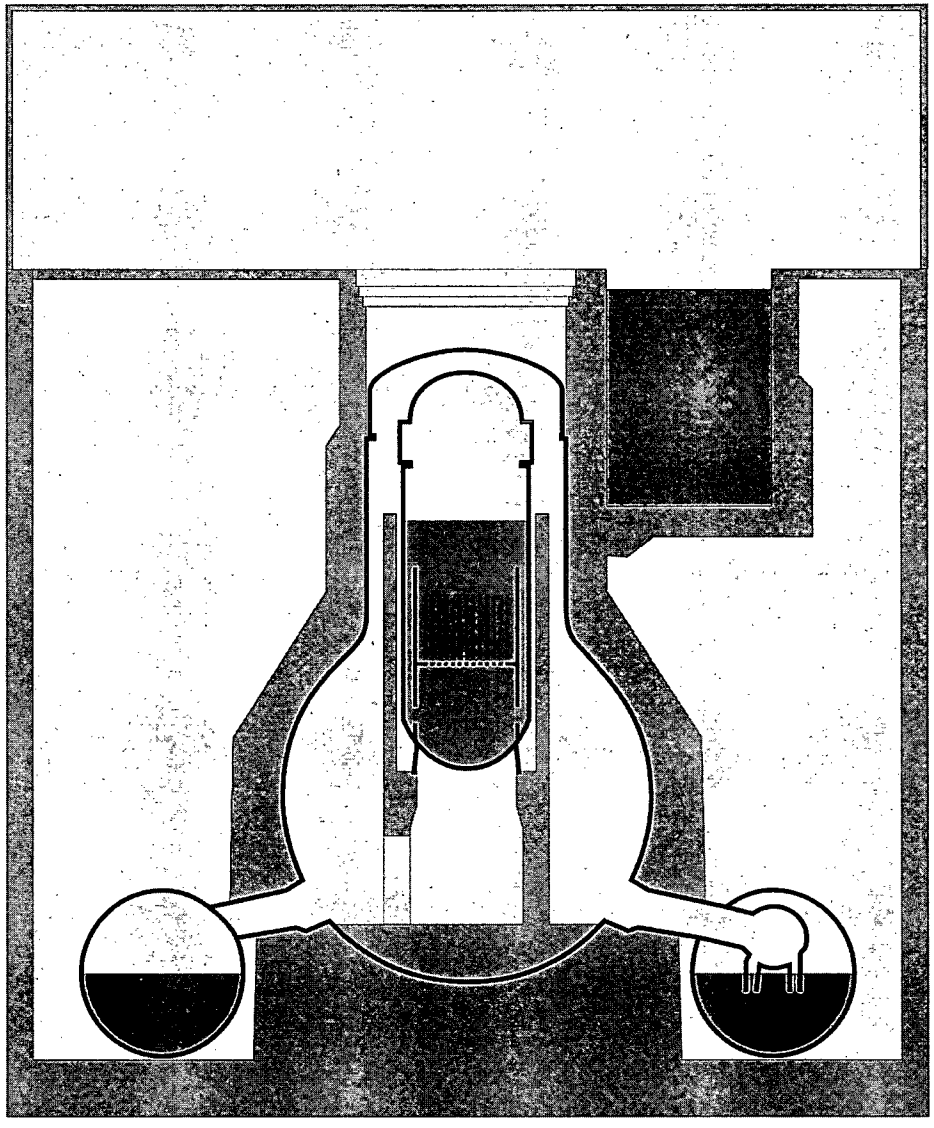
The Fukushima Daiichi Incident
2. Accident progression

- 11.3. 15:41 Tsunami hits the plant
  - Plant Design for Tsunami height of up to 6.5m
  - Actual Tsunami height >7m
  - Flooding of
    - Diesel Generators and/or
    - Essential service water building cooling the generators
- Station Blackout
  - Common cause failure of the power supply
  - Only Batteries are still available
  - Failure of all but one Emergency core cooling systems



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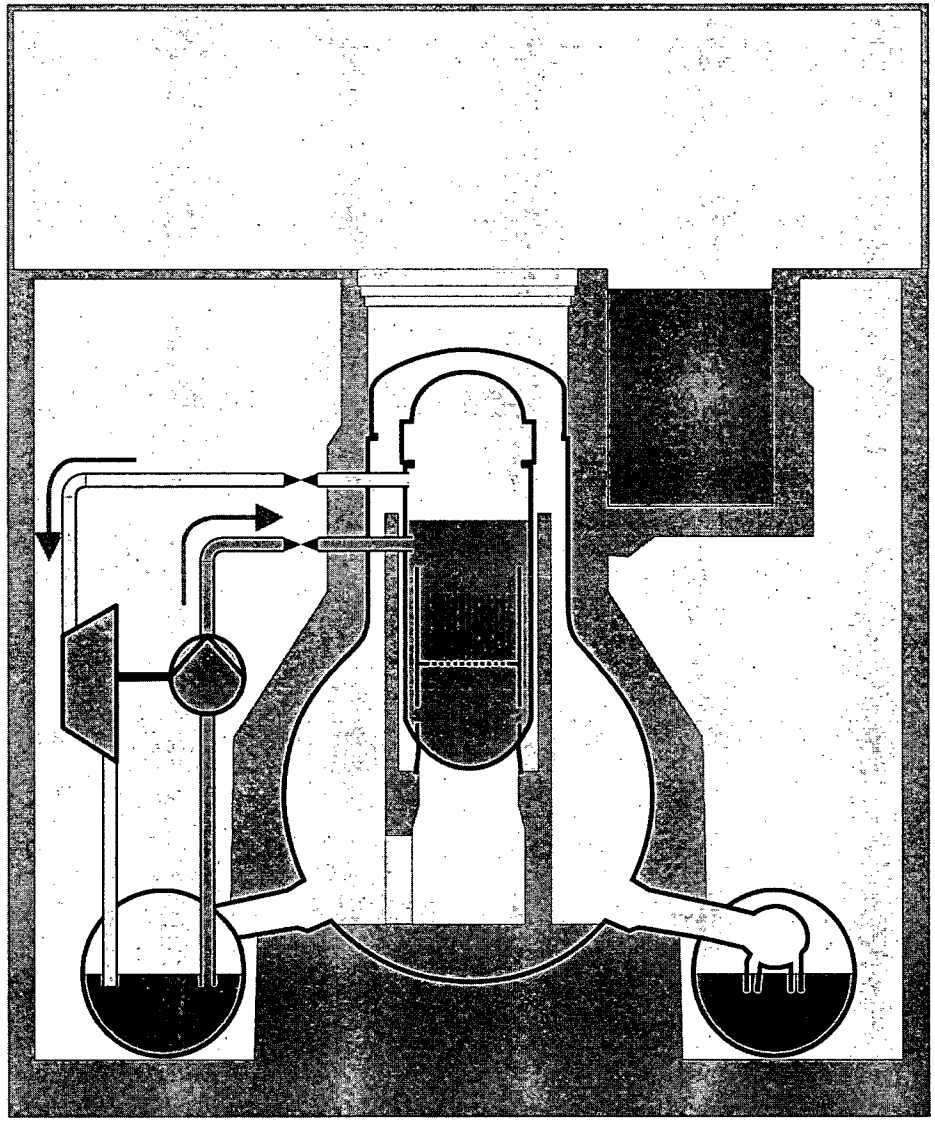
The Fukushima Daiichi Incident
2. Accident progression

- Reactor Core Isolation Pump still available
  - Steam from the Reactor drives a Turbine
  - Steam gets condensed in the Wet-Well
  - Turbine drives a Pump
  - Water from the Wet-Well gets pumped in Reactor
  - Necessary:
    - Battery power
    - Temperature in the wet-well must be below 100°C
- As there is no heat removal from the building, the Core isolation pump cant work infinitely



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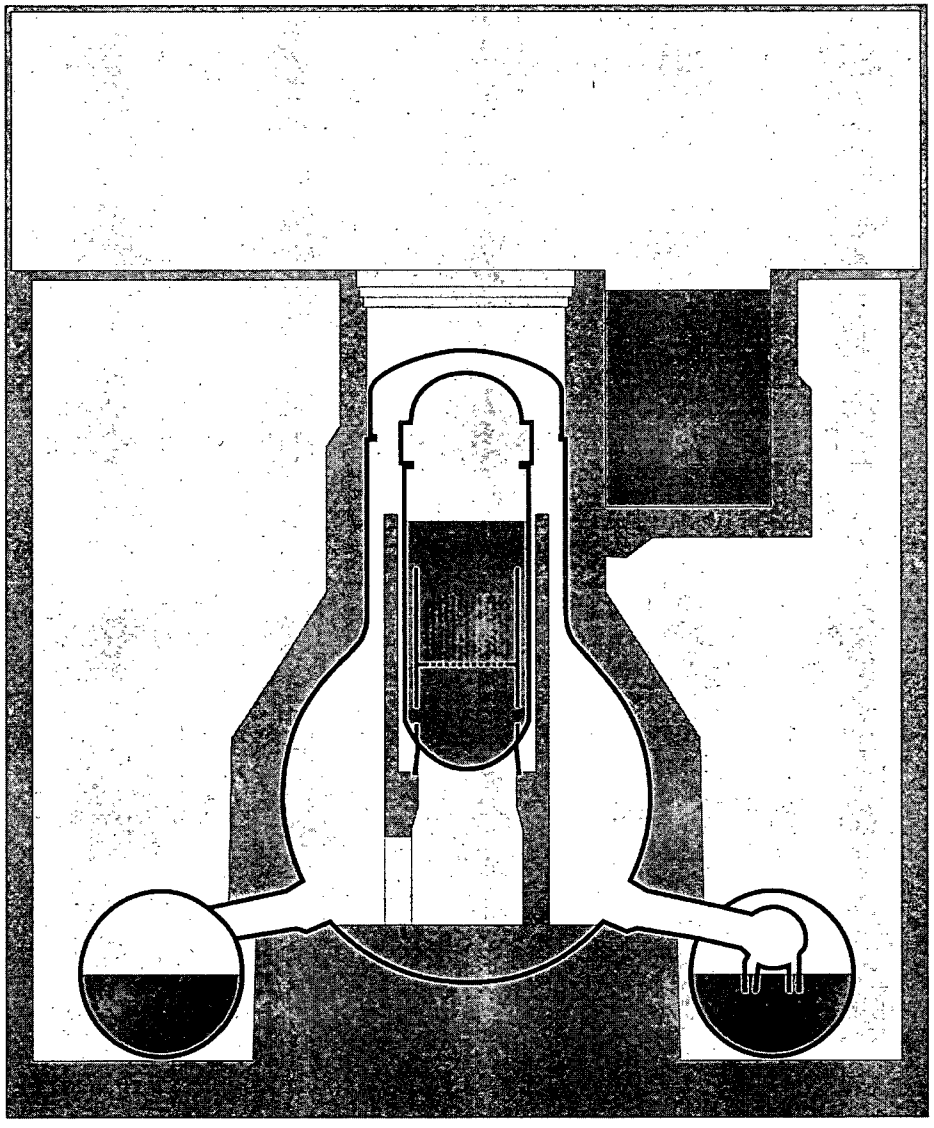
The Fukushima Daiichi Incident
2. Accident progression

- Reactor Isolation pump stops
  - 11.3. 16:36 in Unit 1 (Batteries empty)
  - 14.3. 13:25 in Unit 2 (Pump failure)
  - 13.3. 2:44 in Unit 3 (Batteries empty)
- Decay Heat produces still steam in Reactor pressure Vessel
  - Pressure rising
- Opening the steam relieve valves
  - Discharge Steam into the Wet-Well
- Descending of the Liquid Level in the Reactor pressure vessel



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The Fukushima Daiichi Incident
2. Accident progression

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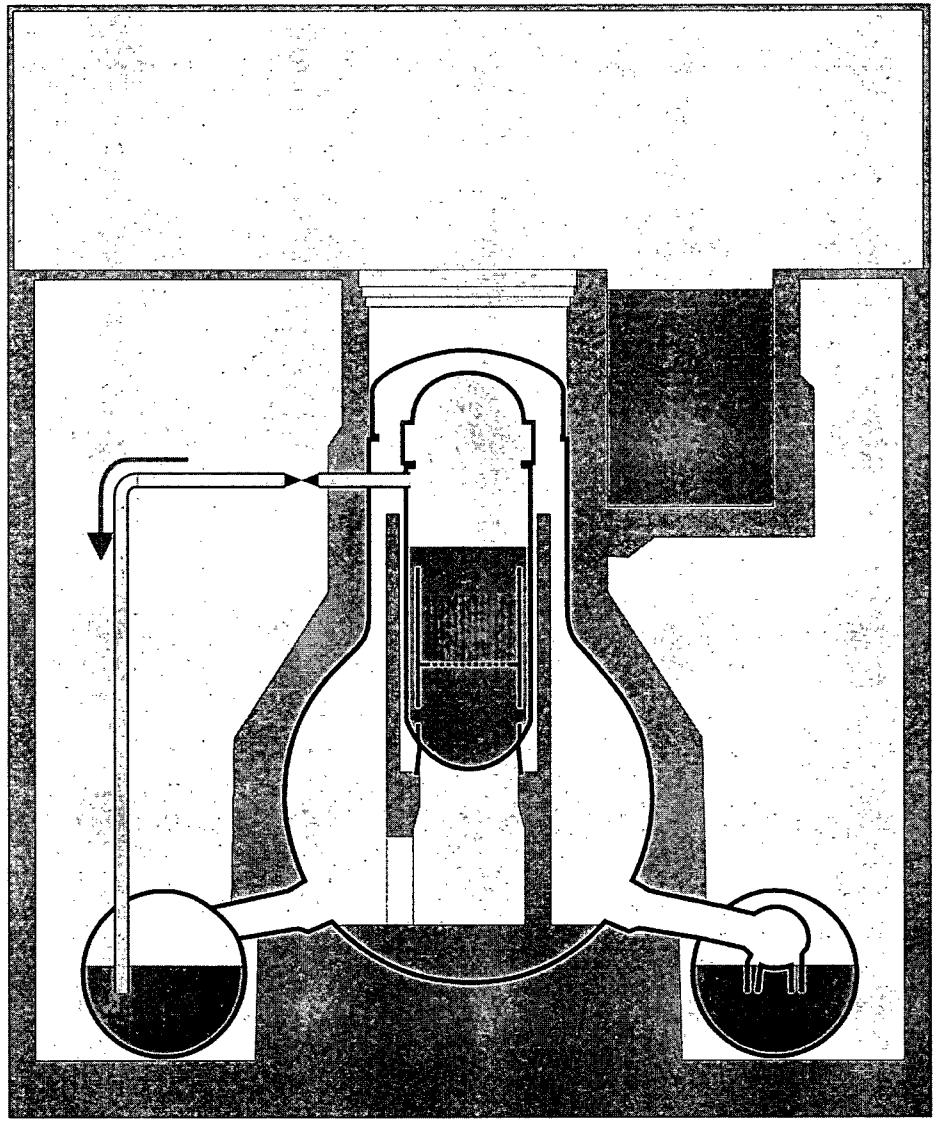

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The Fukushima Daiichi Incident
2. Accident progression

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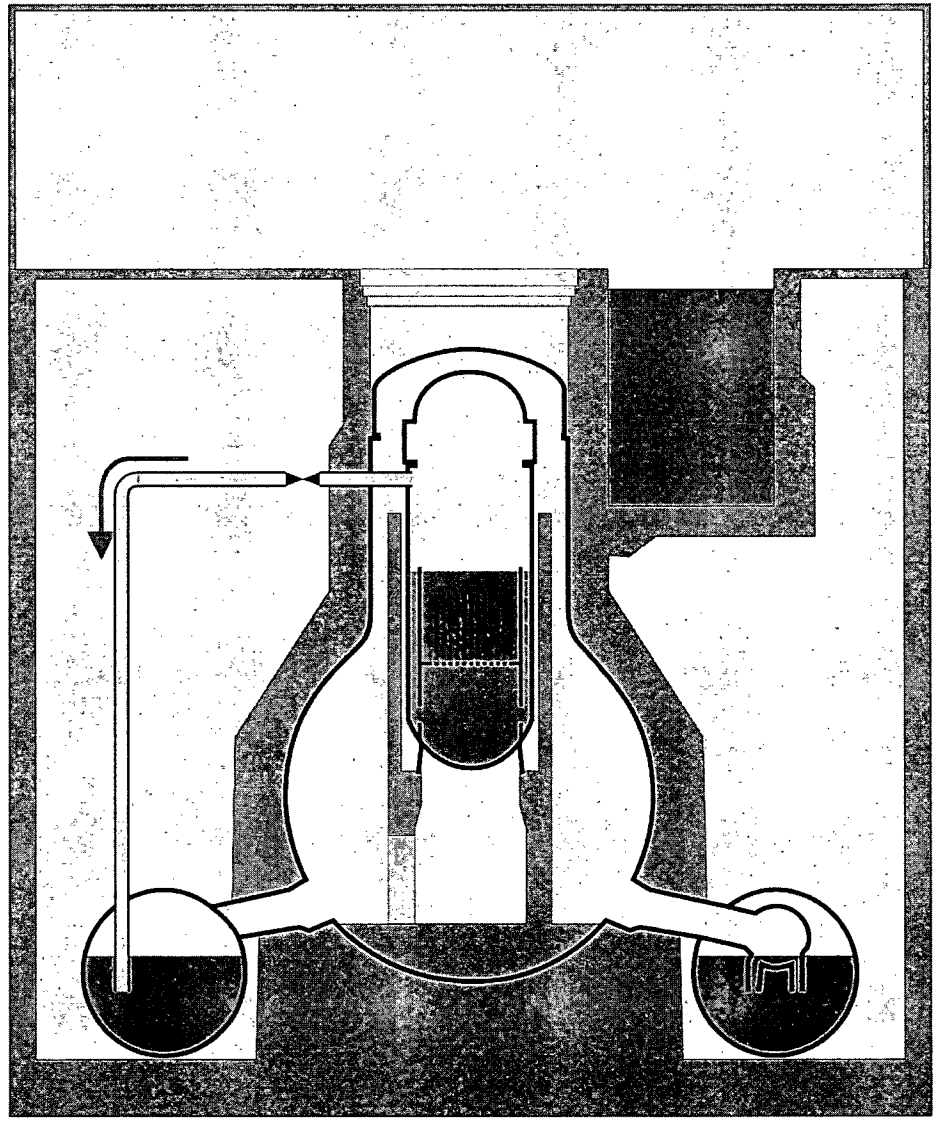

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The Fukushima Daiichi Incident
2. Accident progression

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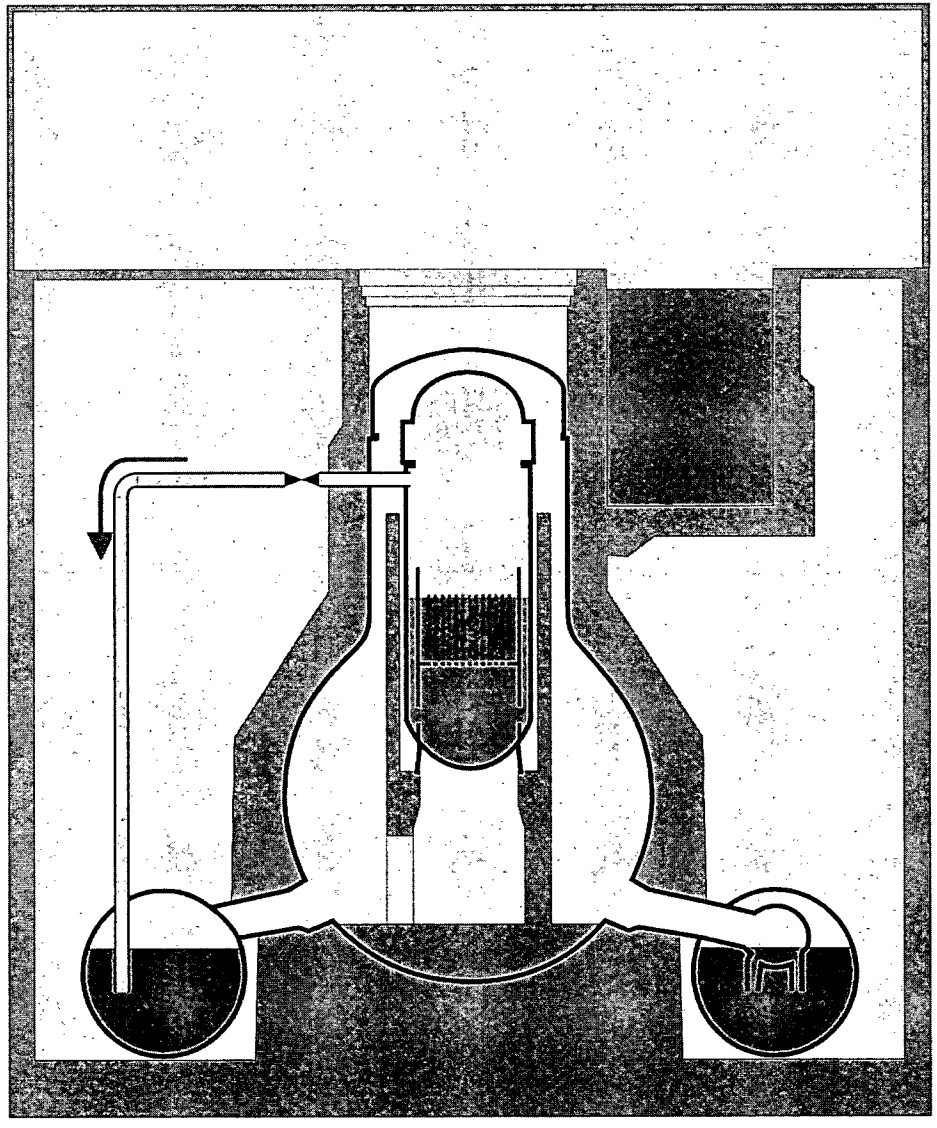

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The Fukushima Daiichi Incident
2. Accident progression

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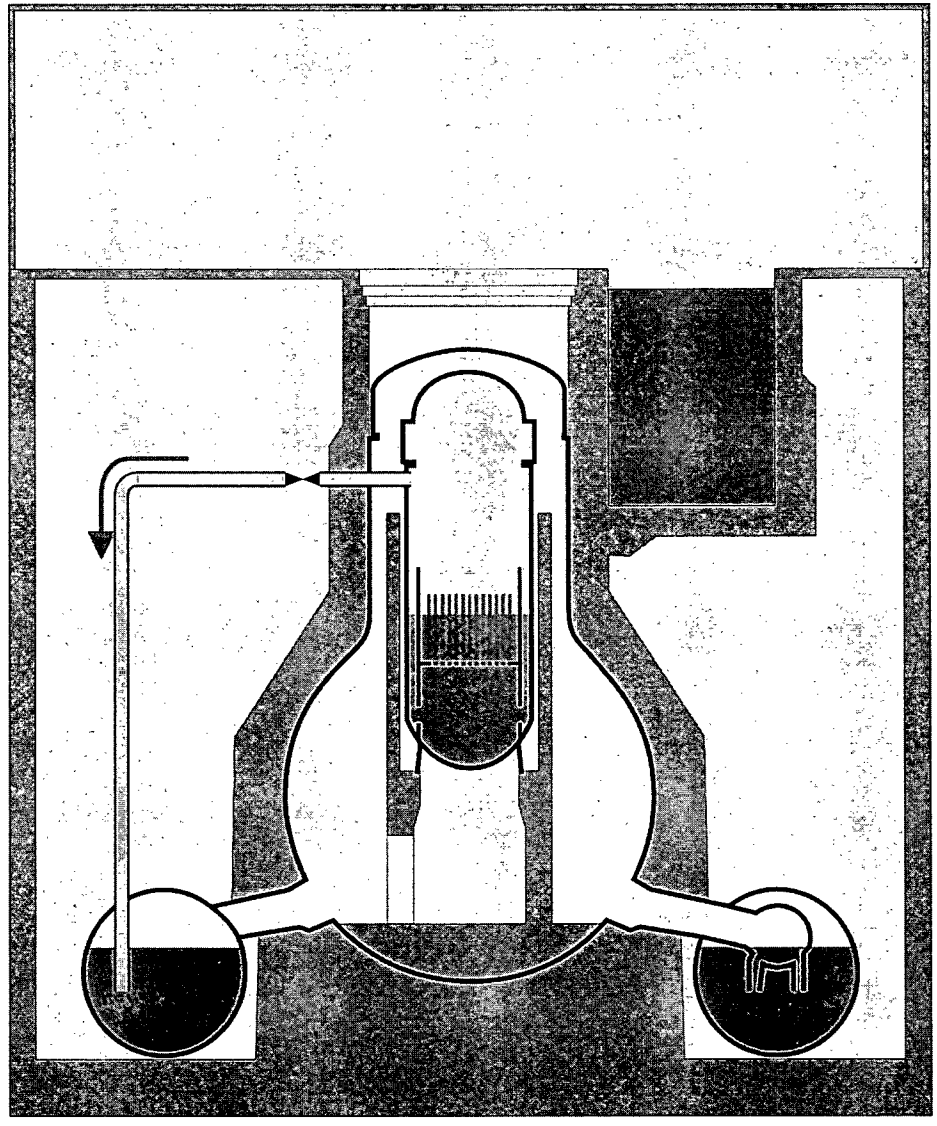

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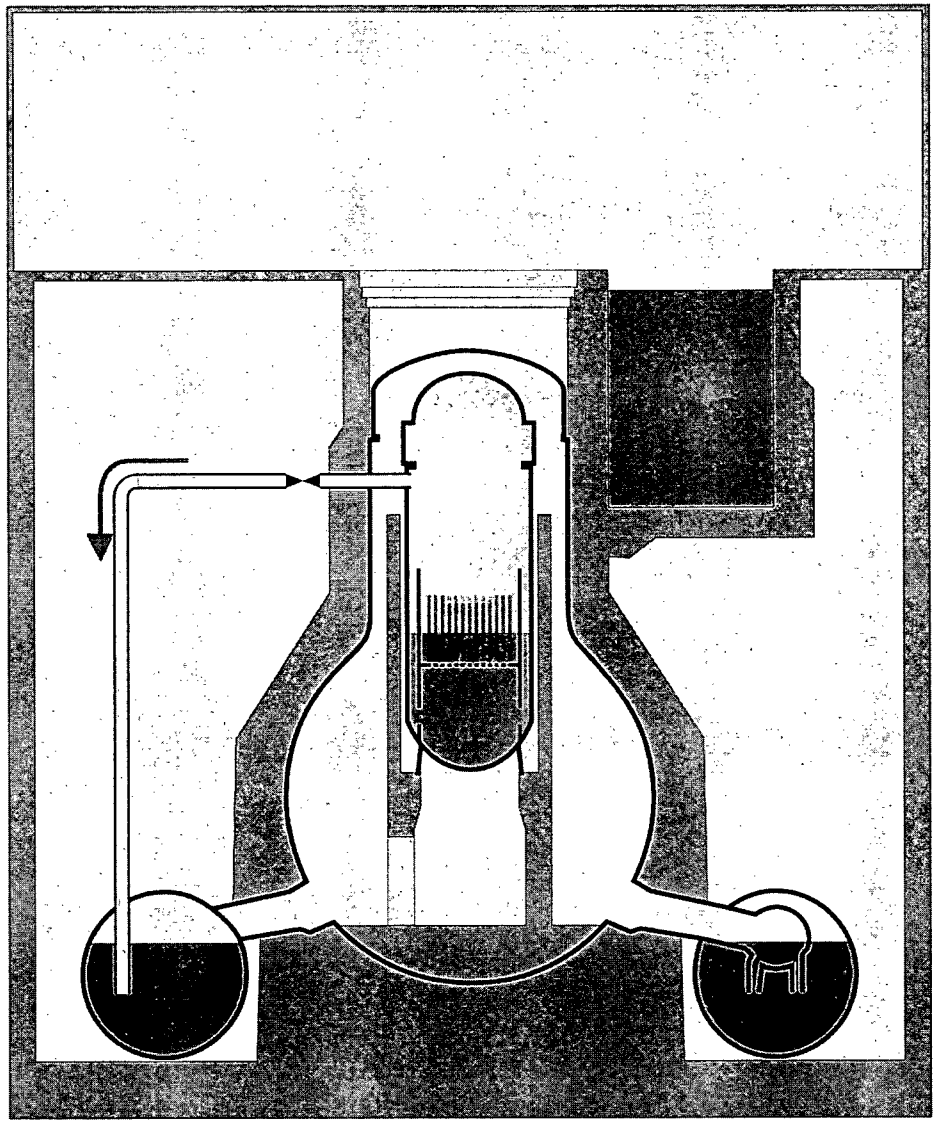
The Fukushima Daiichi Incident
2. Accident progression

- Measured, and here referenced Liquid level is the collapsed level. The actual liquid level lies higher due to the steam bubbles in the liquid

- ~50% of the core exposed
  - Cladding temperatures rise, but still no significant core damage

- ~2/3 of the core exposed
  - Cladding temperature exceeds ~900°C
  - Balooning / Breaking of the cladding
  - Release of fission products form the fuel rod gaps



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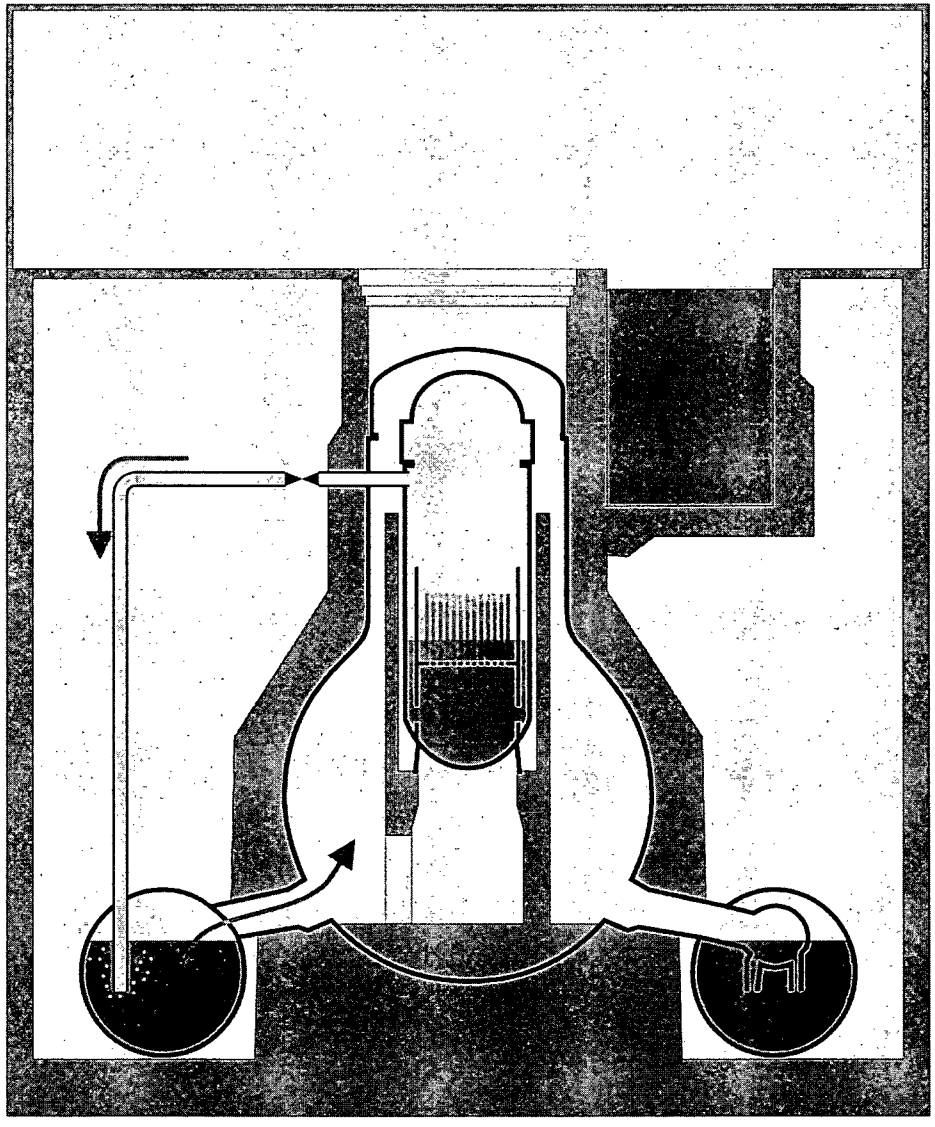
The Fukushima Daiichi Incident

2. Accident progression

- ~3/4 of the core exposed
  - Cladding exceeds ~1200°C
  - Zirconium in the cladding starts to burn under Steam atmosphere
  - **$Zr + 2H_20 \rightarrow ZrO_2 + 2H_2$**
  - Exothermal reaction further heats the core
  - Generation of hydrogen
    - Unit 1: 300-600kg
    - Unit 2/3: 300-1000kg
  - Hydrogen gets pushed via the wet-well, the wet-well vacuum breakers into the dry-well

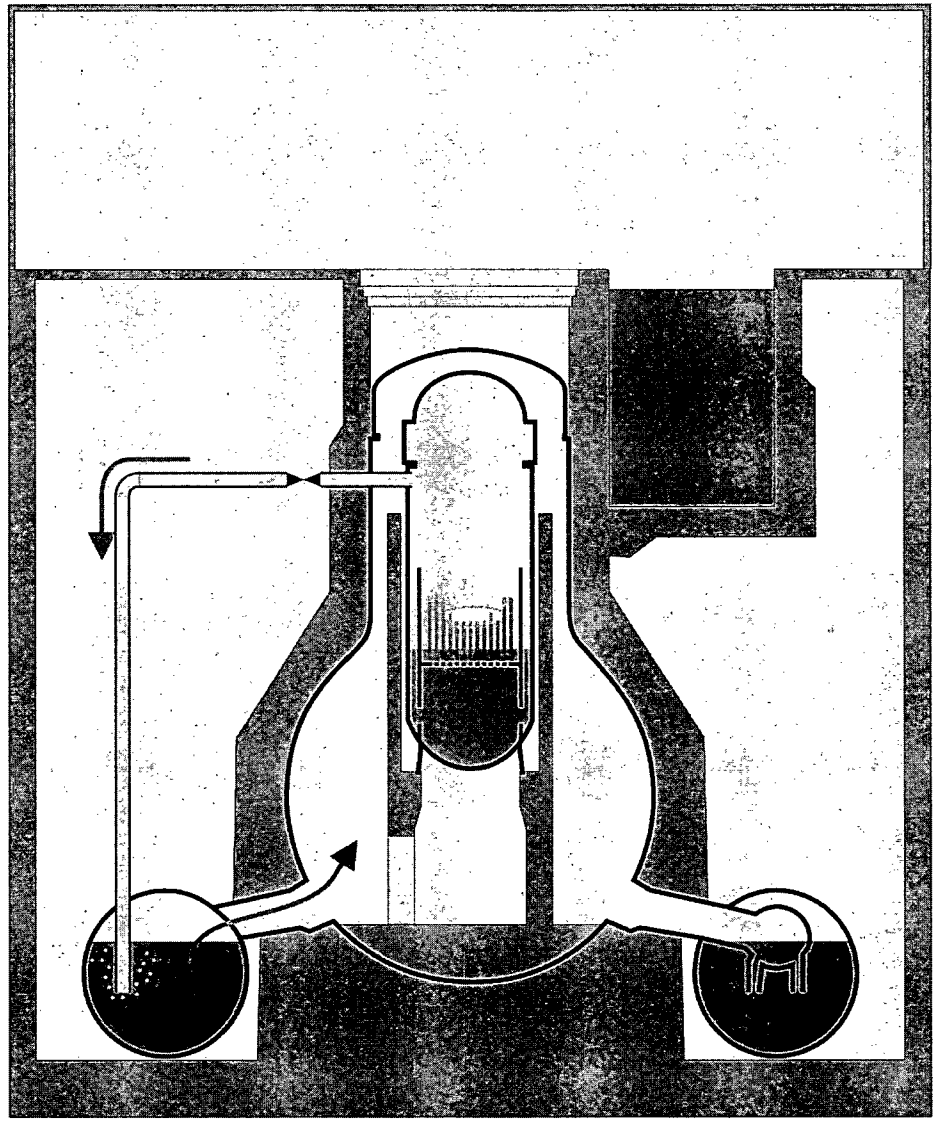


AREVA

The Fukushima Daiichi Incident

2. Accident progression

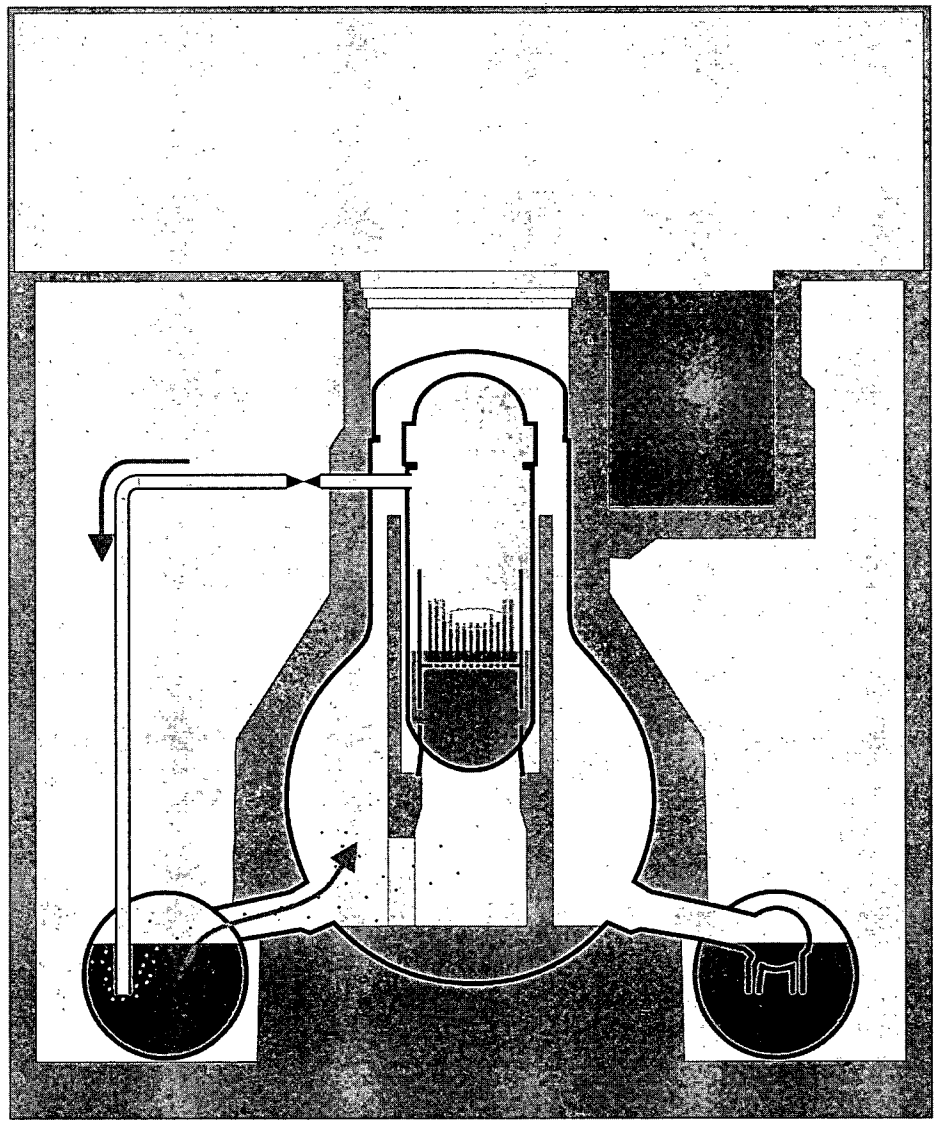
- at ~1800°C [Unit 1,2,3]
  - Melting of the Cladding
  - Melting of the steel structures
- at ~2500°C [Block 1,2]
  - Breaking of the fuel rods
  - debris bed inside the core
- at ~2700°C [Block 1]
  - Melting of Uranium-Zirconium eutectics
- Restoration of the water supply stops accident in all 3 Units
  - Unit 1: 12.3. 20:20 (27h w.o. water)
  - Unit 2: 14.3. 20:33 (7h w.o. water)
  - Unit 3: 13.3. 9:38 (7h w.o. water)



AREVA

The Fukushima Daiichi Incident
2. Accident progression

- Release of fission products during melt down
  - Xenon, Cesium, Iodine,…
  - Uranium/Plutonium remain in core
  - Fission products condensate to airborne Aerosols
- Discharge through valves into water of the condensation chamber
  - Pool scrubbing binds a fraction of Aerosols in the water
- Xenon and remaining aerosols enter the Dry-Well
  - Deposition of aerosols on surfaces further decontaminates air



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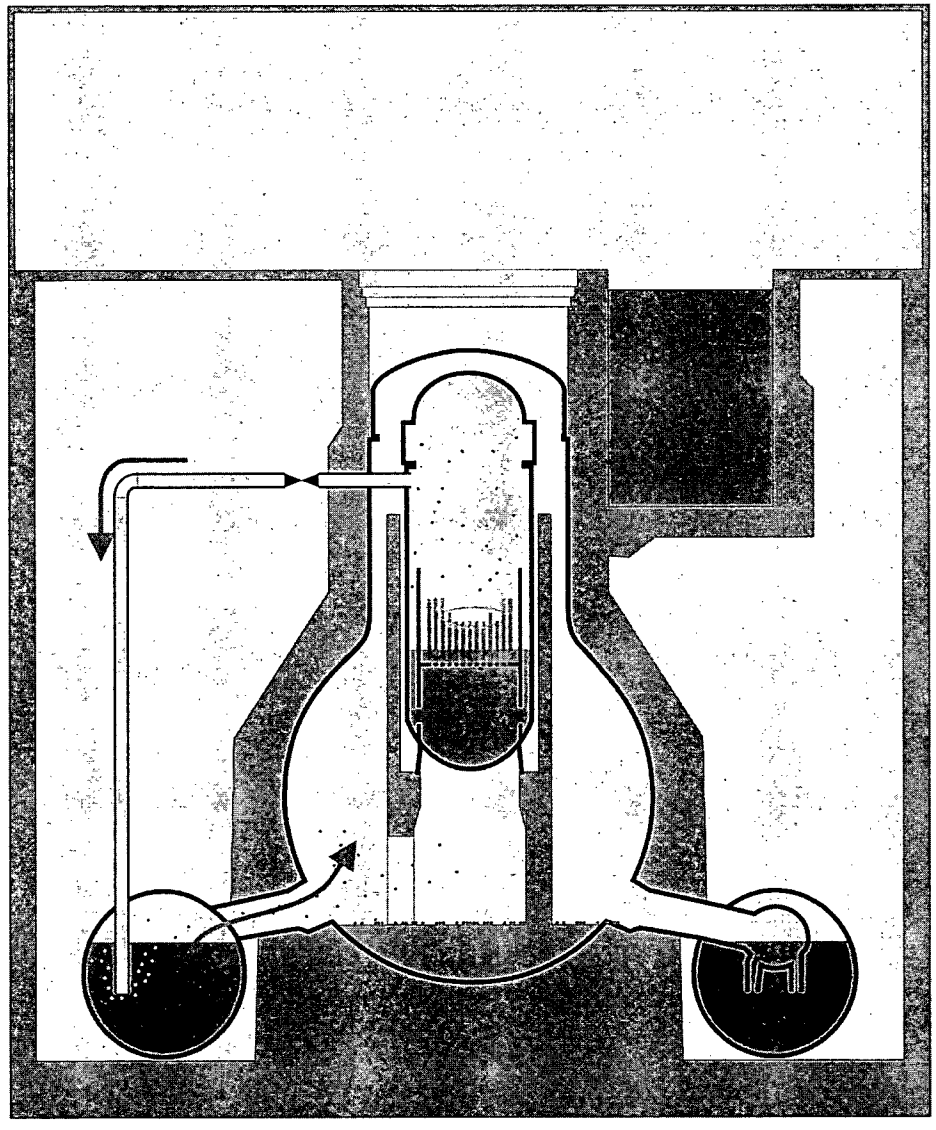
The Fukushima Daiichi Incident

2. Accident progression

- Containment
  - Last barrier between Fission Products and Environment
  - Wall thickness ~3cm
  - Design Pressure 4-5bar
- Actual pressure up to 8 bars
  - Normal inert gas filling (Nitrogen)
  - Hydrogen from core oxidation
  - Boiling condensation chamber (like a pressure cooker)
- Depressurization of the containment
  - Unit 1: 12.3. 4:00
  - Unit 2: 13.3 00:00
  - Unit 3: 13.3. 8.41

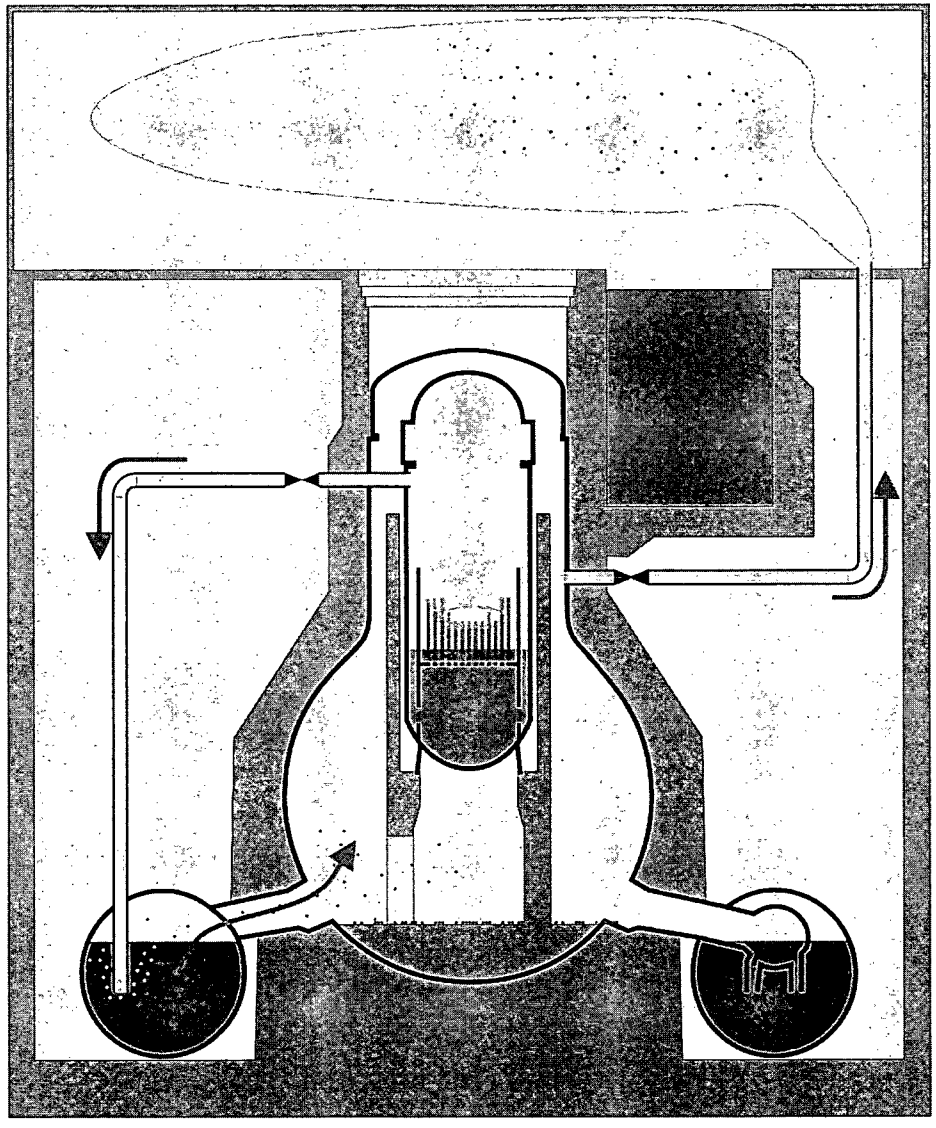


AREVA

The Fukushima Daiichi Incident

2. Accident progression

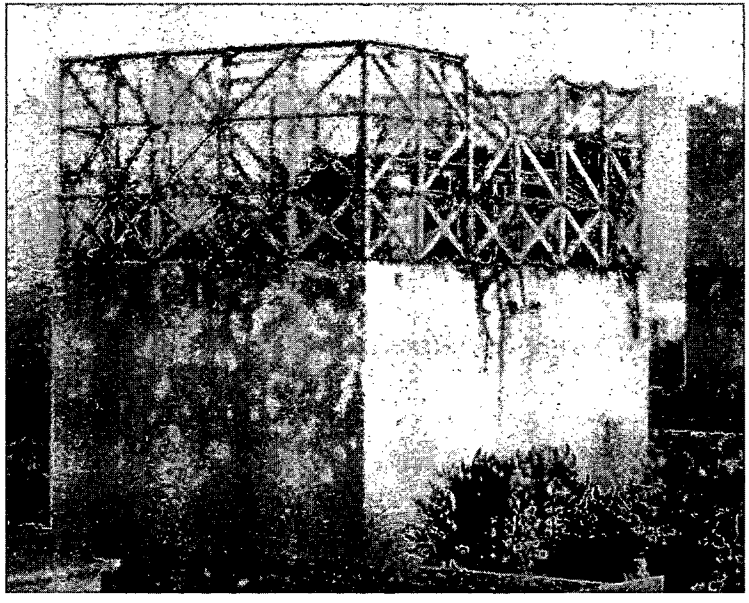
- Positive und negative Aspects of depressurizing the containment
  - Removes Energy from the Reactor building (only way left)
  - Reducing the pressure to ~4 bar
  - Release of small amounts of Aerosols (Iodine, Cesium ~0.1%)
  - Release of all noble gases
  - Release of Hydrogen
- Gas is released into the reactor service floor
  - Hydrogen is flammable

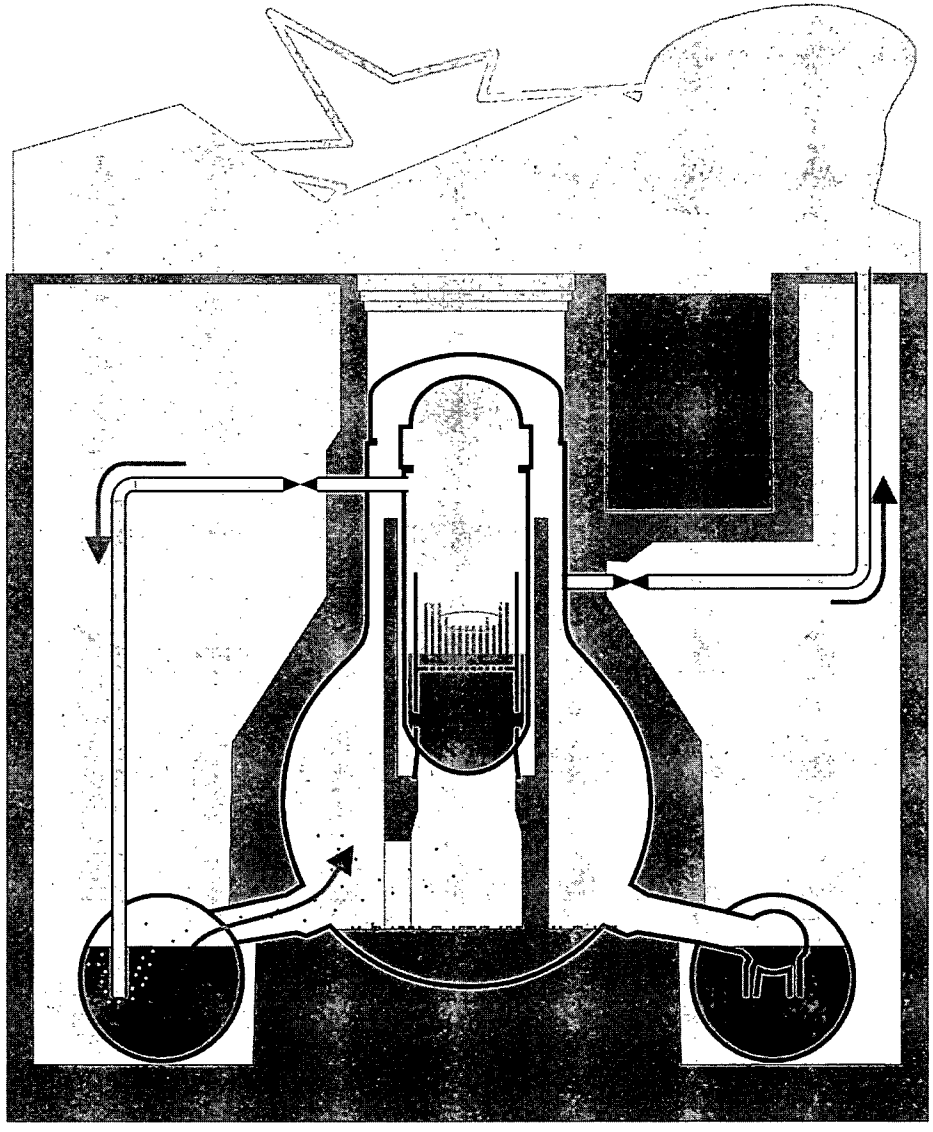


AREVA

The Fukushima Daiichi Incident
2. Accident progression

- Unit 1 und 3
  - Hydrogen burn inside the reactor service floor
  - Destruction of the steel-frame roof
  - Reinforced concrete reactor building seems undamaged
  - Spectacular but minor safety relevant



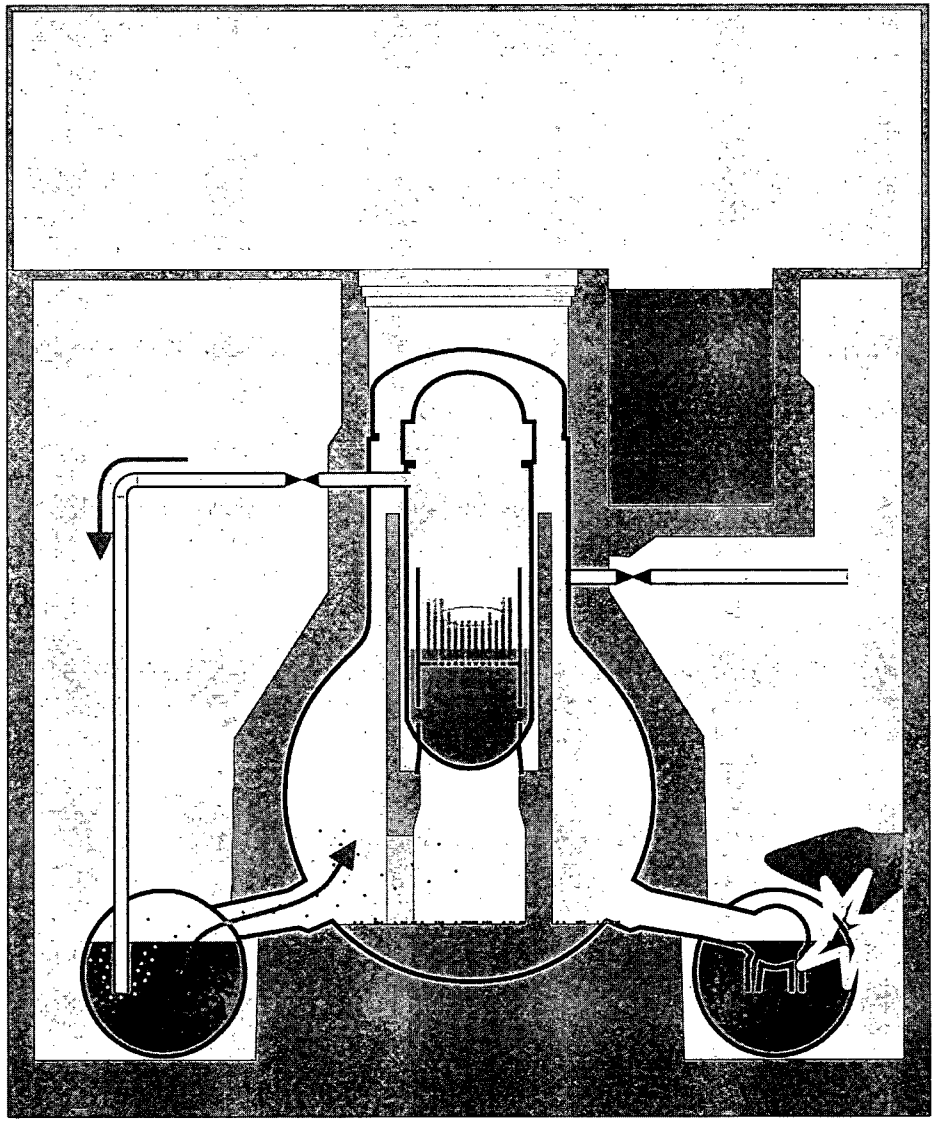


AREVA

The Fukushima Daiichi Incident
2. Accident progression

- Unit 2
  - Hydrogen burn inside the reactor building
  - Probably damage to the condensation chamber (highly contaminated water)
  - Uncontrolled release of gas from the containment
  - **Release of fission products**
  - Temporal evacuation of the plant
  - High local dose rates on the plant site due to wreckage hinder further recovery work

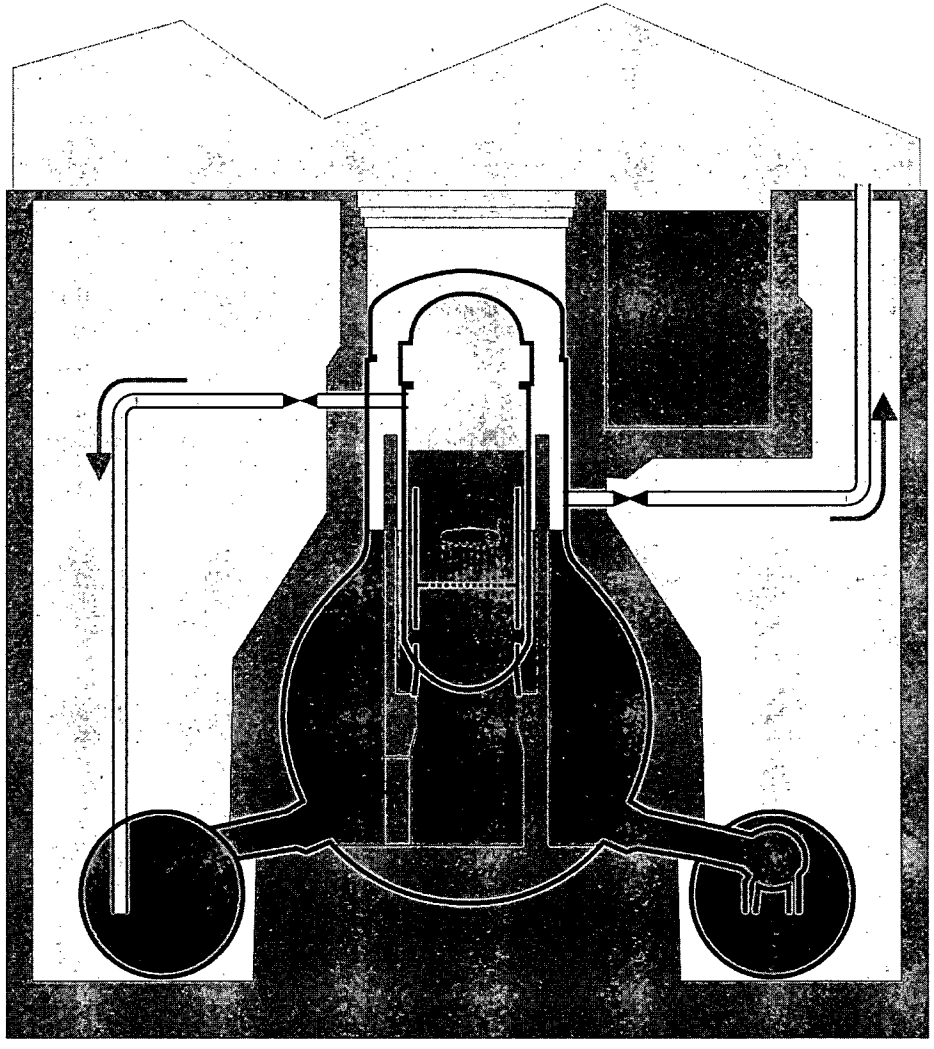
- No clear information's why Unit 2 behaved differently



AREVA

The Fukushima Daiichi Incident
2. Accident progression

- Current status of the Reactors
  - Core Damage in Unit 1,2, 3
  - Building damage due to various burns Unit 1-4
  - Reactor pressure vessels floode in all Units with mobile pumps
  - At least containment in Unit 1 flooded
- Further cooling of the Reactors by releasing steam to the atmospher
- Only small further releases of fission products can be expected



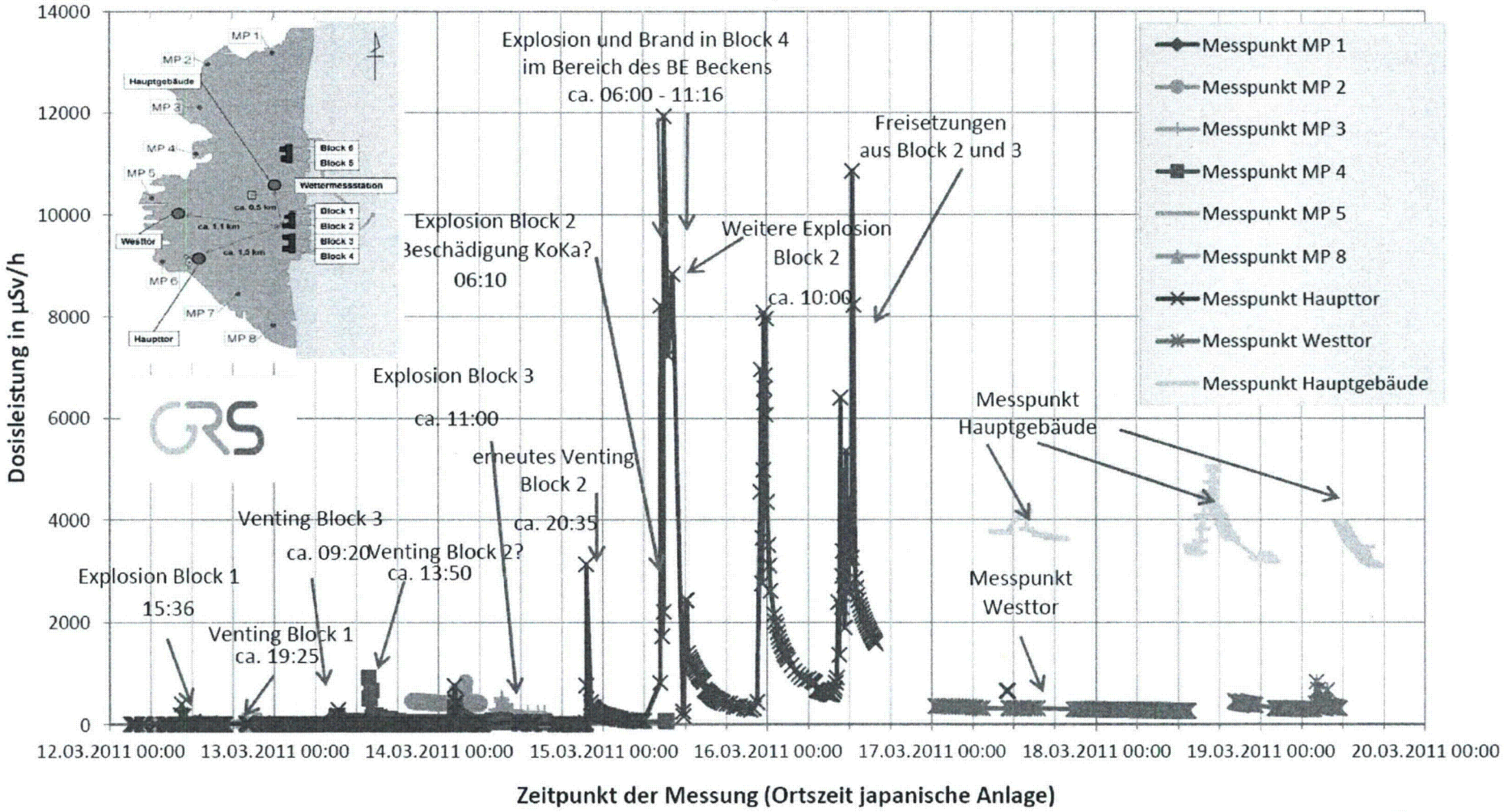
AREVA

The Fukushima Daiichi Incident
3. Radiological releases

- Directly on the plant site
  - Before Explosion in Unit Block 2
    - Below 2mSv / h
    - Mainly due to released radioactive noble gases
    - Measuring posts on west side. Maybe too small values measured due to wind
  - After Explosion in Unit 2 (Damage of the Containment)
    - Temporal peak values 12mSv / h
    - (Origin not entirely clear)
    - Local peak values on site up to 400mSv /h (wreckage / fragments?)
    - Currently stable dose on site at 5mSv /h
    - Inside the buildings a lot more
  - Limiting time of exposure of the workers necessary

AREVA

The Fukushima Daiichi Incident
3. Radiological releases



AREVA

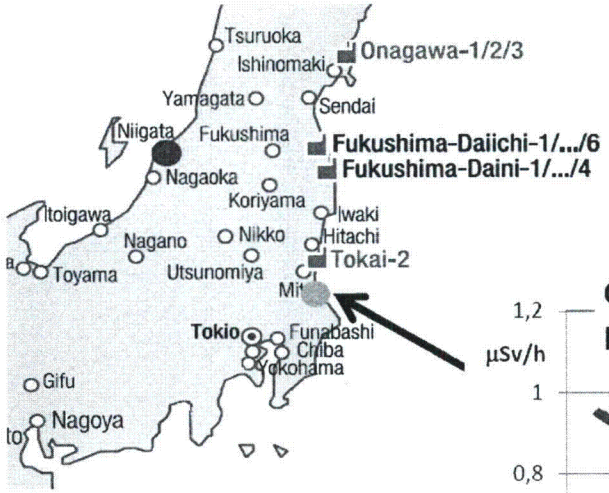
The Fukushima Daiichi Incident
3. Radiological releases

- Outside the Plant site
  - As reactor building mostly intact
    => reduced release of Aerosols (not Chernobyl-like)
  - Fission product release in steam
    => fast Aerosol grows, large fraction falls down in the proximity of the plant
  - Main contribution to the radioactive dose outside plant are the radioactive noble gases
  - Carried / distributed by the wind, decreasing dose with time
  - No „Fall-out“ of the noble gases, so no local high contamination of soil

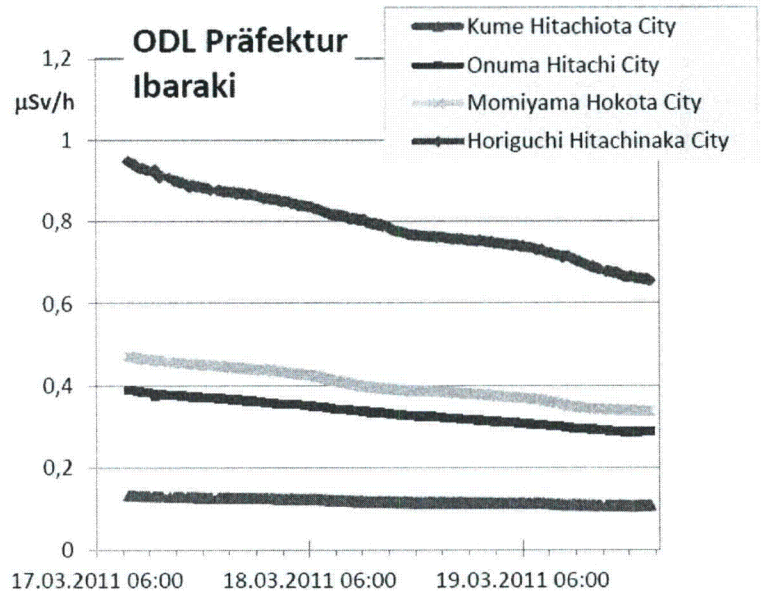
- ~20km around the plant
  - Evacuations were adequate
  - Measured dose up to 0.3mSv/h for short times
  - Maybe destruction of crops / dairy products this year
  - Probably no permanent evacuation of land necessary

AREVA

The Fukushima Daiichi Incident
3. Radiological releases



GRS.de

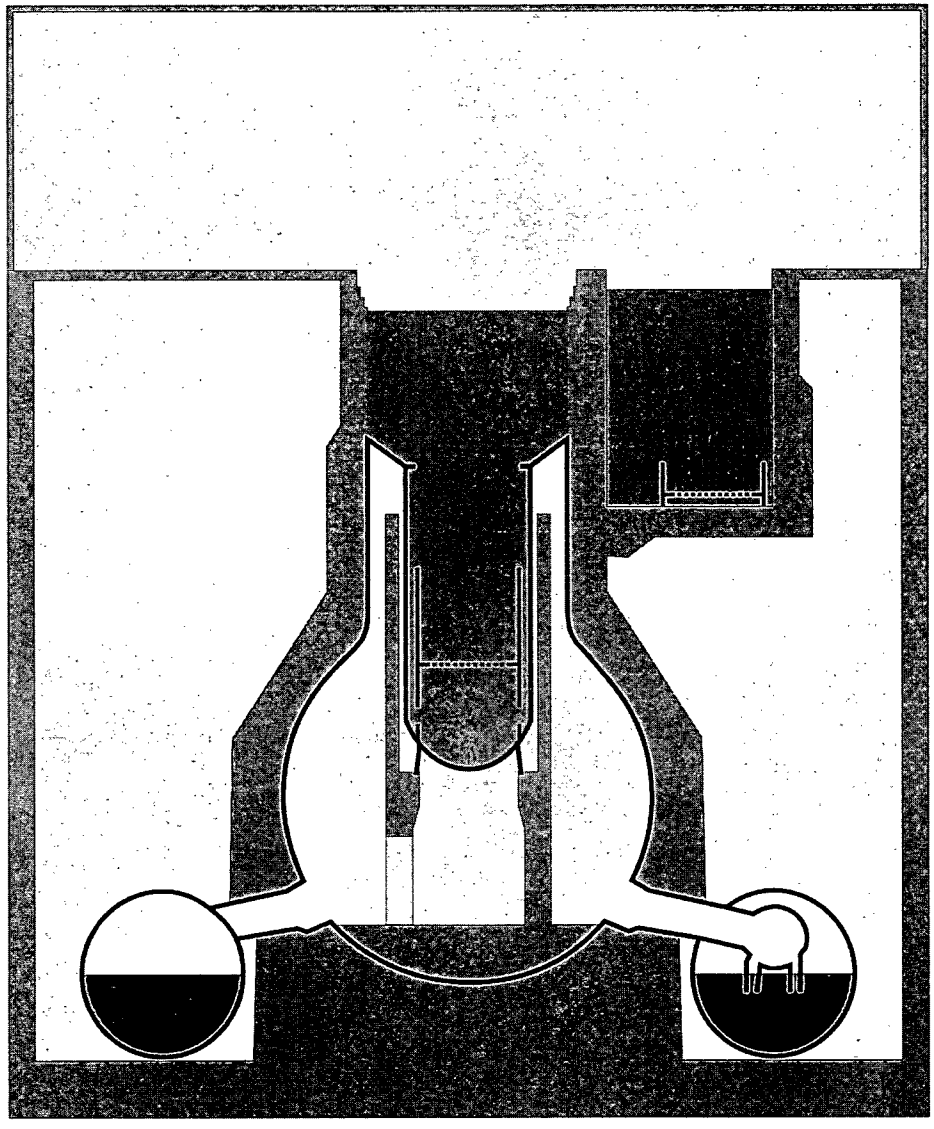


- ~50km around the plant
  - Control of Crop / Dairy products
  - Usage of Iodine pills (Caution, pills can interfere with heart medicine)

AREVA

The Fukushima Daiichi Incident
4. Spend fuel pools

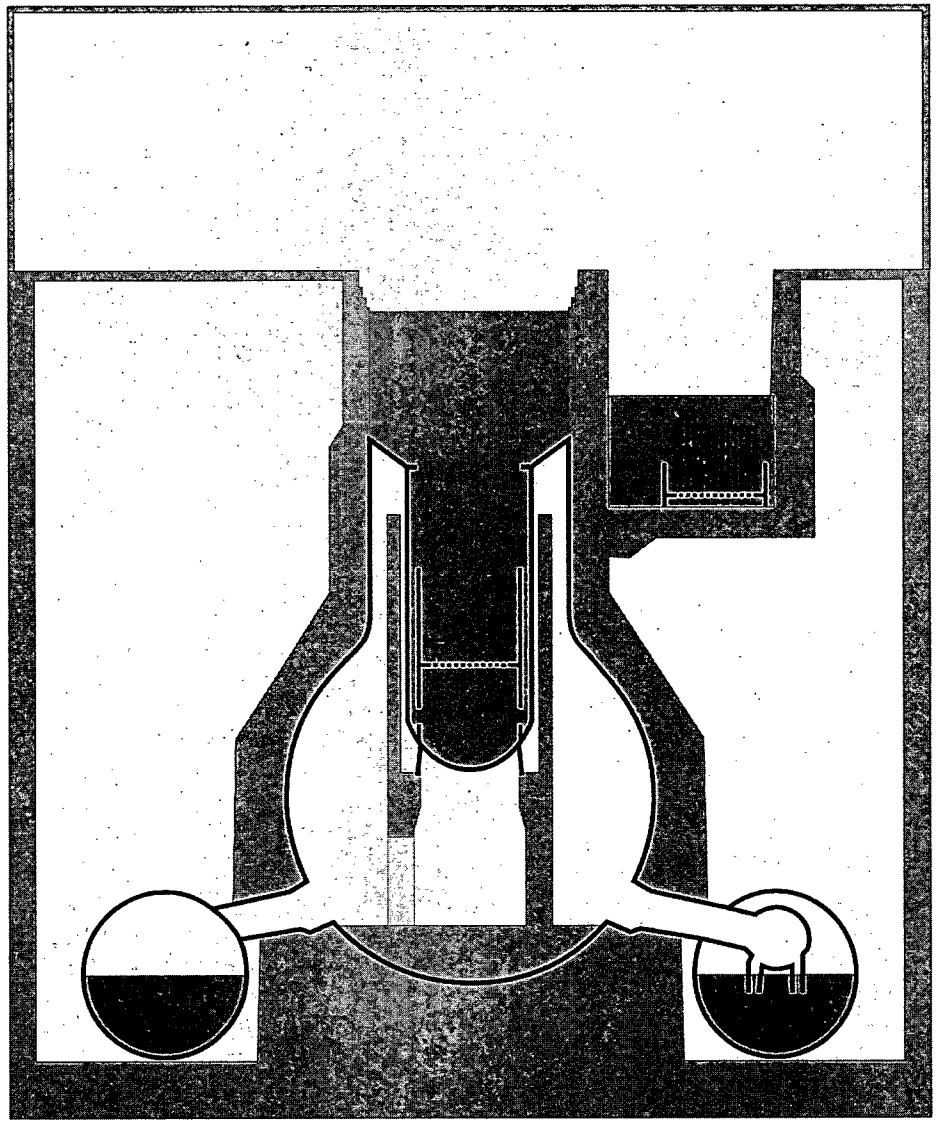
- Spend fuel stored in Pool on Reactor service floor
  - Due to maintenance in Unit 4 entire core stored in Fuel pool
  - Dry-out of the pools
    - Unit 4: in 10 days
    - Unit 1-3,5,6 in few weeks
  - **Leakage of the pools due to Earthquake?**
- Consequences
  - Core melt „on fresh air "
  - Nearly no retention of fission products
  - Large release



AREVA

The Fukushima Daiichi Incident
4. Spend fuel pools

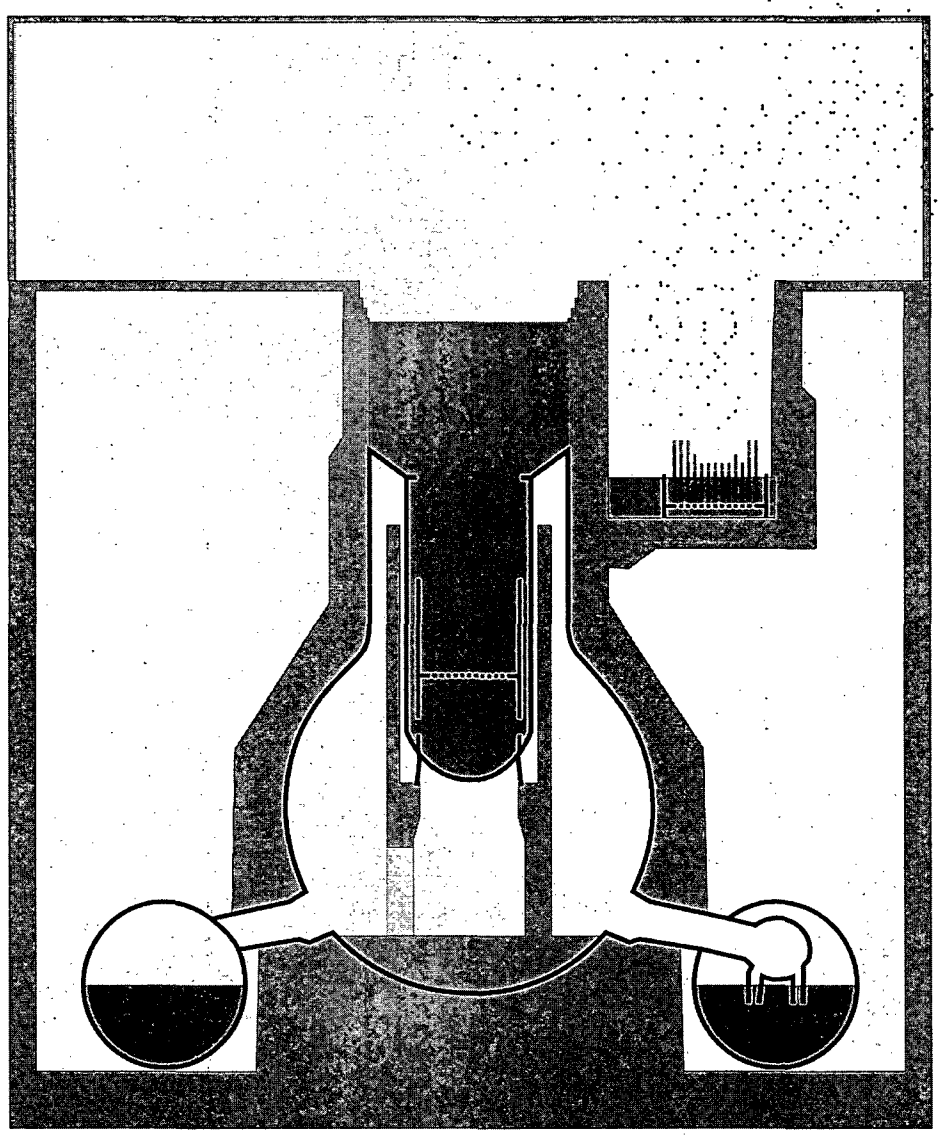
- Spend fuel stored in Pool on Reactor service floor
  - Due to maintenance in Unit 4 entire core stored in Fuel pool
  - Dry-out of the pools
    - Unit 4: in 10 days
    - Unit 1-3,5,6 in few weeks
  - **Leakage of the pools due to Earthquake?**
- Consequences
  - Core melt „on fresh air "
  - Nearly no retention of fission products
  - Large release



AREVA

The Fukushima Daiichi Incident
4. Spend fuel pools

- Spend fuel stored in Pool on Reactor service floor
  - Due to maintenance in Unit 4 entire core stored in Fuel pool
  - Dry-out of the pools
    - Unit 4: in 10 days
    - Unit 1-3,5,6 in few weeks
  - **Leakage of the pools due to Earthquake?**
- Consequences
  - Core melt „on fresh air "
  - Nearly no retention of fission products
  - Large release
- **It is currently unclear if release from fuel pool already happened**



AREVA

The Fukushima Daiichi Incident
5. Sources of Information

- Good sources of Information
  - Gesellschaft für Reaktorsicherheit [GRS.de]
    - Up to date
    - Radiological measurements published
    - German translation of japanese/englisch web pages
  - Japan Atomic Industrial Forum [jaif.or.jp/english/]
    - Current Status of the plants
    - Measurement values of the reactors (pressure liquid level)
  - Tokyo Electric Power Company [Tepco.co.jp]
    - Status of the recovery work
    - Casualties
- May too few information are released by TEPCO, the operator of the plant

AREVA

Bano, Mahmooda

From: Hochevar, Albert R. (INPO) [HochevarAR@INPO.org]
Sent: Saturday, April 02, 2011 4:30 AM
To: Taylor, Robert; Scott, Michael; 'allen.blamey@nrc.gov'
Subject: Fw: Quote from the Japanese Press

Release

From: Spinnato, Roger E (WANO)
To: Hochevar, Albert R. (INPO)
Cc: Webster, Bill E (INPO)
Sent: Sat Apr 02 00:24:26 2011
Subject: Quote from the Japanese Press

You and your team might be interested in the last paragraph fro this article in the Japanese Press:

Release

French President Nicolas Sarkozy visited Prime Minister Naoto Kan's office in Tokyo on Thursday.

Kan thanked France for expressing sympathy for the victims of the March 11th earthquake and tsunami and for showing its support and solidarity for Japan since.

He also thanked Sarkozy for visiting Japan as the head of France, which currently holds the rotating presidency of the Group of Eight summit talks. Kan said Japanese people are determined to stand together to overcome the crisis, and asked France for continued support.

Sarkozy said he pays respect to the Japanese people who are facing their greatest crisis since World War Two with dignity and courage.

He added that he was shocked to see footage disaster-stricken areas, but deeply impressed by the heroic operations now under way at the nuclear plant.

After the meeting, Kan and Sarkozy held a news conference and announced that France will lead the international community to help Japan resolve the problems at the crippled plant and come up with decontamination measures. France has the second largest of nuclear power stations in the world.

PPPP | 134

Mitchell, Mark

From: Mitchell, Mark
Sent: Sunday, April 03, 2011 8:20 AM
To: ken.lyons@exeloncorp.com
Cc: terrence.simpkin@exeloncorp.com
Subject: RE: Emailing: SALLE API 031711-032411 Gamma Results L45565

Ken,

Thanks for the update.

As of last week we were coordinating all Exelon (both midwest and east) through Ron Chrzanowski in Cantera. Apparently, you and all the Exelon facilities are sending him the data. The hope was that there would be a measure of efficiency and each plant would not have to take the time to prepare the data and individually interface with NRC personnel on this. What we have received from Ron has been very helpful.

I hope this saves you and your staff time and effort. I apologize for not directly following up with you on this change. Thank you for your willingness to provide this data during this extrordinary time.

Mark

From: ken.lyons@exeloncorp.com [ken.lyons@xeloncorp.com]
Sent: Friday, April 01, 2011 1:00 PM
To: Mitchell, Mark
Cc: terrence.simpkin@exeloncorp.com
Subject: Emailing: SALLE API 031711-032411 Gamma Results L45565

<<SALLE API 031711-032411 Gamma Results L45565.pdf>> Mark,

Latest data indicates we have I-131 on our iodine cardridges from our REMP samples, see attached. We should have enough rain tomorrow to pull our first controled rainwater sample. We will notify you when we get results. We will also notify you of any issues with our milk samples, scheduled to be drawn on 4/7/2011. Below is the condition description for the Issue Report.

Radioactive Iodine (I-131) was detected in weekly air charcoal samples taken in accordance with LaSalle Stations Radiological Environmental Monitoring Program (REMP). This event is related to the Fukushima Daiichi event in Japan, not licensed operations at LaSalle Station.
Multiple independent utilities, Exelon included, reported detection of licensed material in REMP/rain/recapture samples (reference IR# 1191071 written by corporate chemistry). This is the first indication of fallout from the Fukushima Daiichi event detected at LaSalle. Previously, LaSalle station has not detected I-131 in its REMP air sample stations at concentrations above the LLD.

Upon discovery within the industry that fallout was occurring in the United States, Corporate Chemistry/Environmental held a peer group call to discuss actions going forward. The decision was made to perform additional isotopic analysis on REMP samples already being collected and analyzed. Corporate Environmental took the lead on compiling and trending the results. Preliminary results from 3/17/11 - 3/24/11 REMP samples at LaSalle Station indicate I-131 results that range from 1.09E-01 pCi/m3 to 1.79 pCi/m3. The highest concentration was detected at sample stations upwind of LaSalle Station. No other licensed gamma emitting nuclides were detected. It is expected that Iodine and possibly other nuclides will continue to be detected for some time after the Fukushima Daiichi event has been remediated, dependent upon the half lives of the nuclides released from the Fukushima Daiichi site.

PPPP/135

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From: LIA07 Hoc
Sent: Sunday, April 03, 2011 4:51 AM
To: LIA07 Hoc
Subject: 0430 EDT (April 3, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: USNRC Earthquake-Tsunami Update.040311 0430EDT.pdf

Attached, please find a 0430 EDT, April 3, 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
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)

PPPP/136

Mitchell, Mark

From: ronald.chrzanowski@exeloncorp.com
Sent: Monday, April 04, 2011 3:32 PM
To: tlevering@mde.state.md.us; Phalen, Martin; larry.haskell@illinois.gov; tolewis@state.pa.us; Mitchell, Mark
Cc: peter.orphanos@exeloncorp.com; vince.cwietniewicz@exeloncorp.com; david.helker@exeloncorp.com
Subject: RE: Exelon Nuclear site measurements of Japanese Fallout Data
Attachments: Japanese Fallout data 040411.xls

Subject: Exelon Nuclear site measurements of Japanese Fallout Data

I have attached the updated information for rainwater, and milk. There was one new rainwater data point where Cs-134 was detected at our Byron Plant in Illinois. There was no new air cartridge data from last week's update. Oyster Creek does not have a dairy near the facility, therefore, they do not perform milk sampling per their Offsite Dose Calculation Manual and commitments.

I ask that if any of this data is shared to please let me know who it was shared with.

To be complete, Quad Cities, Byron, LaSalle, Clinton, Dresden and Braidwood stations are in Illinois. I have listed them from West to East in location.

TMI, Peach Bottom, Limerick are in Pennsylvania.

Oyster Creek is in New Jersey.

I will continue to update you when additional data is available.

Ron Chrzanowski
Exelon Nuclear
Corporate Chemistry Manager
630-657-3200

PPPP 137

Date	Location	Type	Control	Detail	I-131 (pCi/L)	Cs-134(pCi/L)
3/23/2011	Limerick	rain (roof drain)	Yes	offsite	92.7	
3/23/2011	TMI	rain	Yes	MS-1	95.4	
3/24/2011	Oyster	rain	Yes		127.0	
3/24/2011	Quad Cities	rain (roof drain)	Yes	offsite	39.0	
3/24/2011	Quad Cities	rain (roof drain)	Yes	offsite	19.4	
3/25/2011	TMI	rain	Yes	MS-1	51.1	
3/29/2011	Limerick	rain	Yes	36S2	24.5	
4/1/2011	Byron	rain	Yes	offsite	40.8	5.91

Comments
6 miles nnw from Limerick
Control/background location
Met Tower Road
10 mile ssw of plant Port Byron, IL
15 mile west Bettendorf, IA
onsite control
20 miles NE of plant

Date	Location	Type	Control	Detail	I-131 (pCi/m3)	Comments	
3/14/2011 9:42	Limerick	REMP/charcoal	Yes	22G1	Not Detected		
3/14/2011 9:44	Peach Bottom	REMP/charcoal	yes	5H2	Not Detected		N 40o 02' 03.7"
3/15/2011 12:35	Byron	REMP/charcoal	Yes	BY-08	Not Detected		
3/16/2011 9:16	Oyster Creek	REMP/charcoal	Yes	C	Not Detected		
3/16/2011 10:48	Clinton	REMP/charcoal	Yes	CL-11	Not Detected		
3/16/2011 12:50	TMI	REMP/charcoal	Yes	TM-AI-Q15-1	Not Detected		
3/17/2011 8:40	LaSalle	REMP/charcoal	Yes	L-10	Not Detected		
3/17/2011 15:40	Braidwood	REMP/charcoal	Yes	BD-03	Not Detected		
3/17/2011 15:40	Braidwood	REMP/charcoal	Yes	BD-03 DUP	Not Detected		
3/18/2011 8:00	Dresden	REMP/charcoal	Yes	D-12	Not Detected		
3/18/2011 13:40	Quad Cities	REMP/charcoal	Yes	Q-42	Not Detected		
3/22/2011 9:46	Limerick	REMP/charcoal	Yes	22G1	Not Detected		
3/22/2011 9:48	Peach Bottom	REMP/charcoal	Yes	5H2	Not Detected		N 40o 02' 03.7"
3/22/2011 13:05	Byron	REMP/charcoal	Yes	BY-08	0.100		
3/23/2011 8:36	Oyster Creek	REMP/charcoal	Yes	C	Not Detected		
3/23/2011 10:38	Clinton	REMP/charcoal	Yes	CL-11	Not Detected		
3/23/2011 12:55	TMI	REMP/particulate	Yes	TM-AP-Q15-1	0.05048	NW	N 40° 16' 38.9"
3/23/2011 12:55	TMI	REMP/charcoal	Yes	TM-AI-Q15-1	0.05654	NW	N 40° 16' 38.9"
3/24/2011 8:40	LaSalle	REMP/charcoal	Yes	L-10	0.06561		
3/24/2011 15:00	Braidwood	REMP/charcoal	Yes	BD-03	0.04964		
3/25/2011 8:00	Dresden	REMP/charcoal	Yes	D-12	0.07316		

W 75o 48' 48.2"

W 75o 48' 48.2"

W 76° 55' 10.6"	13.4	309
W 76° 55' 10.6"	13.4	309

Date	Location	Type	Control	Detail	I-131 (pCi/m3)	Comments
3/15/2011 9:55	Limerick	REMP	Yes	23F1	Not Detected	
3/15/2011 9:55	Limerick	REMP	Yes	23F1	Not Detected	
3/16/2011 9:30	TMI	REMP	Yes	TM-M-F4-1	Not Detected	
3/17/2011 11:40	Peach Bottom	REMP		D	Not Detected	
3/23/2011 10:15	Limerick	REMP	Yes	23F1	Not Detected	
3/30/2011 10:10	Limerick	REMP	Yes	23F1	Not Detected	
3/30/2011 10:10	TMI	REMP	Yes	TM-M-F4-1	Not Detected	

Mitchell, Mark

From: Ramirez, Frances
Sent: Monday, April 04, 2011 9:51 AM
To: Kemker, Brian; Shah, Nirodh; Mitchell, Mark
Cc: Ruiz, Robert
Subject: I-131 sample AR
Attachments: 1196063.htm

Please see attached IR. It complements the I-131 report that we sent Friday.

Frances

PPPP/138

Go Go Back Print | New Search | Home

AR 01196063 Report

Aff Fac:	LaSalle	**AR Type:**	CR	**Status:**	APPROVED
Aff Unit:	NA	**Owed To:**	A8632CHCAP	**Due Date:**	05/01/2011
Aff System:	--			**Event Date:**	04/01/2011
CR Level/Class:	4/D			**Disc Date:**	04/01/2011
How Discovered:	H02			**Orig Date:**	04/01/2011
WR/PIMS AR:		**Equip Tag:**	-		

Action Request Details

Subject: REMP - RESULTS OF FUKUSHIMA IMPACT MONITORING SHOW I-131

Description: Originator: TODD HAPAK Supv Contacted: Ken Lyons

Condition Description:
Radioactive Iodine (I-131) was detected in weekly air charcoal samples taken in accordance with LaSalle Stations Radiological Environmental Monitoring Program (REMP). This event is related to the Fukushima Daiichi event in Japan, not licensed operations at LaSalle Station. Multiple independent utilities, Exelon included, reported detection of licensed material in REMP/rain/recapture samples (reference IR# 1191071 written by corporate chemistry). This is the first indication of fallout from the Fukushima Daiichi event detected at LaSalle. Historically, LaSalle station has not detected I-131 in its REMP air sample stations at concentrations above the LLD.

Upon discovery within the industry that fallout was occurring in the United States, Corporate Chemistry/Environmental held a peer group call to discuss actions going forward. The decision was made to perform additional isotopic analysis on REMP samples already being collected and analyzed. Corporate Environmental took the lead on compiling and trending the results. Preliminary results from 3/17/11 3/24/11 REMP samples at LaSalle Station indicate I-131 results that range from 1.09E-01 pCi/m3 to 1.79 pCi/m3. The highest concentration was detected at sample stations upwind of LaSalle Station. No other licensed gamma emitting nuclides were detected. It is expected that Iodine and possibly other nuclides will continue to be detected for some time after the Fukushima Daiichi event has been remediated, dependent upon the half lives of the nuclides released from the Fukushima Daiichi site.

Immediate actions taken:

Contacted contract sample analysis vendor with regards to the results, notified Supervisor and Chemistry Manager, notified and forwarded a copy of the results to Corporate Environmental.

Recommended Actions:
This IR is being generated to document the detection of licensed material in REMP samples at LaSalle Station as a direct result of the ongoing Fukushima Daiichi incident, originating from the earthquake and tsunami in March 2011. Close to information provided.

Operable Basis:

Reportable Basis:

Reviewed by: RUDY L CAPUTO 04/02/2011 00:48:36 CDT
Reviewer Comments:
Shift review complete - there are no Tech Spec/TRM/ODCM actions applicable; reportability criterion affected; or any system availability or functionality concerns raised by this issue.

SOC Reviewed by: ROBERT G COCKREL 04/03/2011 16:58:23 CDT
SOC Comments:
Close to information provided.

Assignments

Assign #:	01	**Assigned To:**		**Status:**	AWAIT/C
Aff Fac:	LaSalle	**Prim Grp:**	ACAPALL	**Due Date:**	04/06/2011
Assign Type:	TRKG	**Sec Grp:**		**Orig Due Date:**	
Priority:					
Schedule Ref:					
Unit Condition:					
Subject/Description:	REMP - RESULTS OF FUKUSHIMA IMPACT MONITORING SHOW I-131				

From: LIA07 Hoc
Sent: Monday, April 04, 2011 6:41 AM
To: LIA07 Hoc; Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update - 0700 EDT, April 4, 2011
Attachments: April 4 0700 EDT Brief one pager .pdf

Attached, please find updated information for the "Go Books".

The update includes:

- The 0700 04/04/11 One-Pager Briefing Sheet

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

-Jim

Jim Anderson
Executive Briefing Team Coordinator
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)
James.anderson@nrc.gov

PPPP/139

経済産業省
Ministry of Economy, Trade and Industry

April 5, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 75th Release)
(As of 16:00 April 5th, 2011)

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

Major updates are as follows.

1. Nuclear Power Stations (NPSs)

- Fukushima Dai-ichi NPS
  - The 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)
  - 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) (15:40 April 5th)

PPPP/140

(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 13:00 April 5th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.409(A) 0.720(B)	0.083(A) 0.083(B)	0.106(A) 0.018(C)	—	0.106	0.106
CV Pressure (D/W) [kPa]	150	100	107.1	—	—	—
Reactor Water Level*2 [mm]	-1,700(A) -1,650(B)	-1,500(A) Not available(B)	-1,850(A) -2,250(B)	—	1,710	1,887
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	150	down scale (under survey)	173.3	—	—	—
Spent Fuel Pool Water Temperature [℃]	Indicator Failure	71.0	Indicator Failure	Indicator Failure	34.8	27.5
Time of Measurement	06:00 April 5th	06:00 April 5th	10:20 April 5th	April 5th	13:00 April 4th	13:00 April 4th

*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)
- White smoke was confirmed to generate continuously. (As of 06:30 April 5th)
- Fresh water injection to RPV is being carried out. (As of 16:00 April 5th)

<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)
- White smoke was confirmed to generate continuously. (As of 06:30 April 5th)
- 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)
- 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 to RPV is being carried out. (As of 16:00 April 5th)

<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)
- The pressure in Primary Containment Vessel (PCV) of Unit 3 rose unusually. (07:44 March 14th) TEPCO reported to NISA on the event

falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)

- In Unit 3, the explosion like Unit 1 occurred around the reactor building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the main control room of Units 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation of water injection. (11:30 March 16th)
- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)
- The Self-Defence Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)
- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground using 6 fire engines (6 tons of water spray per engine) was carried out by the Self-Defence Force. (From before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (Finished at 14:45 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department carried out the water spray. (Finished at 03:40 March 20th)
- The pressure in PCV of Unit 3 rose (320 kPa 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)
- White smoke was confirmed to generate continuously (As of 06:30 April 5th)
- Fresh water injection to RPV is being carried out. (As of 16:00 April 5th)

<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)
- White smoke was confirmed to generate continuously. (As of 06:30 April 5th)

<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 07:10 April 5th, water temperature of the pool was around 29℃.

<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 on the same day)

● 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 5th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.14	0.10	0.17
Reactor water temperature	℃	25.5	25.4	32.7	30.0
Reactor water level*2	mm	9,296	10,346	7,804	8,785
Suppression pool water temperature	℃	23	24	27	30
Suppression pool pressure	kPa (abs)	106	105	102	102
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. 0.40 μSV/h (16:00 April 5th) (Approx. 0.43 μSV/h (16:00 April 4th))

(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.

(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.

(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.

< Possibility on radiation exposure (As of 16:00 April 5th) >

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 3rd, the screening was done to 126,063 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 1 to 15 years old were carried out at the Iwaki City Public Health Center. The result was not at the level of having harmful influence.

(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 15:00 April 4th)>

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 15:00 April 5th)>

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 4th)

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 4th)

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

directive ・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.

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経済産業省
Ministry of Economy, Trade and Industry

April 5, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 74th Release)
(As of 08:00 April 5th, 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 over the Spent Fuel Pool of Unit 3 using Concrete Pump Truck was carried out. (From 17:03 till 19:19 April 4th)
  - 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 on the same day)
  - 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. (21:00 April 4th)

PPPP\141

(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 07:00 April 5th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.409(A) 0.720(B)	0.083(A) 0.083(B)	0.112(A) 0.020(C)	–	0.104	0.106
CV Pressure (D/W) [kPa]	150	100	107.8	–	–	–
Reactor Water Level*2 [mm]	-1,700(A) -1,650(B)	-1,500(A) Not available(B)	-1,850(A) -2,250(B)	–	1,705	1,873
Suppression Pool Water Temperature (S/C) [℃]	–	–	–	–	–	–
Suppression Pool Pressure (S/C) [kPa]	150	down scale (under survey)	173.3	–	–	–
Spent Fuel Pool Water Temperature [℃]	Indicator Failure	71.0	Indicator Failure	Indicator Failure	35.5	28.5
Time of Measurement	06:00 April 5th	06:00 April 5th	05:40 April 5th	April 5th	07:00 April 5th	07:00 April 5th

*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)
- White smoke was confirmed to generate continuously. (As of 06:30 April 5th)
- Fresh water injection to RPV is being carried out. (As of 08:00 April 5th)

<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)
- White smoke was confirmed to generate continuously. (As of 06:30 April 5th)
- Fresh water injection to RPV is being carried out. (As of 08:00 April 5th)

<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)
- The pressure in Primary Containment Vessel (PCV) of Unit 3 rose unusually. (07:44 March 14th) TEPCO reported to NISA on the event falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)
- In Unit 3, the explosion like Unit 1 occurred around the reactor building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the main control room of Units 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the

room and restarted the operation of water injection. (11:30 March 16th)

- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)
- The Self-Defence Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)
- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground using 6 fire engines (6 tons of water spray per engine) was carried out by the Self-Defence Force. (From before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (Finished at 14:45 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department carried out the water spray. (Finished at 03:40 March 20th)
- The pressure in PCV of Unit 3 rose (320 kPa 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)
- Water spray of around 70t using Concrete Pump Truck (50t/h) was carried out. (From 17:03 till 19:19 April 4th)
- White smoke was confirmed to generate continuously (As of 06:30 April 5th)
- Fresh water injection to RPV is being carried out. (As of 08:00 April 5th)

<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)
- White smoke was confirmed to generate continuously. (As of 06:30 April 5th)

<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 08:10 April 4th, water temperature of the pool was around 28℃.

<Other>

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

  (As the result of measurement on 29 March, it was detected as 3,355.0 times higher than the limit in water (13:55 March 29th). On the other

hand, as the result of the analysis at the northern side of the Water Discharge Canal of the NPS, 4.6×10^1Bq/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 on the same day)

● 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 5th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.14	0.10	0.17
Reactor water temperature	℃	25.7	25.5	32.7	29.9
Reactor water level*2	mm	9,296	10,346	7,806	8,785
Suppression pool water temperature	℃	23	24	27	30
Suppression pool pressure	kPa (abs)	106	105	102	102
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. 0.43 μSV/h (16:00 April 4th) (approx. 0.45 μSV/h (16:00 April 3rd))

(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.

(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.

(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.

< Possibility on radiation exposure (As of 08:00 April 5th) >

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 2nd, the screening was done to 122,613 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 1 to 15 years old were carried out at the Iwaki City Public Health Center. The result was not at the level of having harmful influence.
(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 15:00 April 4th)>

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 15:00 April 4th)>

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 area falls below the provisional regulation limits, considering the situation of the Fukushima Dai-ichi Nuclear Power Station.
- However, the tests shall be carried out nearly weekly after the lifting, while the release of the radioactive materials from the nuclear power station continues.

(1) Items under the suspension of shipment and restriction of intake (As of April 4th)

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**,	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	*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 4th)

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.

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From: OST01 HOC
Sent: Monday, April 25, 2011 4:03 PM
To: FOIA Response.hoc Resource
Subject: FW: FOR UPDATE: Japan One Pager 1500 EDT 4-22-11 .docx
Attachments: Japan One Pager 1500 EDT 4-25-11 ---- PMT Edits .doc; Japan One Pager 1500 EDT 4-25-11 pmt edits .docx

-----Original Message-----
From: Hoc, PMT12
Sent: Monday, April 25, 2011 1:02 PM
To: OST01 HOC
Cc: Uhle, Jennifer
Subject: RE: FOR UPDATE: Japan One Pager 1500 EDT 4-22-11 .docx

Please see attached for PMT edits...

Thanks,
Jack

-----Original Message-----
From: OST01 HOC
Sent: Monday, April 25, 2011 12:56 PM
To: Uhle, Jennifer; Hoc, PMT12; RST01 Hoc; LIA08 Hoc
Subject: FOR UPDATE: Japan One Pager 1500 EDT 4-22-11 .docx

*** Attachments are OUO ***

Attached is the copy from Friday. Please update and return to me by 1400.

Thank you,

Rebecca Clinton
EST Coordinator

*** Attachments are OUO ***

PPPP/142

Bano, Mahmooda

From: Gard, Lee A (INPO) [GardLA@INPO.org] Release
Sent: Tuesday, April 05, 2011 5:15 AM
To: Scott, Michael
Subject: Re: TEPCO ENGINEER TO ENGINEER TALKS GOING ON RIGHT NOW

Mike - looking Fwd to working with you again after many yrs See you Thursday Lee Gatd

Sent from my iPhone

On Apr 5, 2011, at 2:26 AM, "Scott, Michael" <Michael.Scott@nrc.gov<mailto:Michael.Scott@nrc.gov>> wrote:

I believe that in Japan those are "Ah so" moments. ☺ Glad it's going well.

Mike

From: Hochevar, Albert R. (INPO) [mailto:HochevarAR@INPO.org] Release
Sent: Tuesday, April 05, 2011 2:16 AM
To: Blamey, Alan; Scott, Michael; Miller, Marie; Giessner, John; Bernhard, Rudolph; john.monniger@nrc.gov<mailto:john.monniger@nrc.gov>; Salay, Michael
Cc: Gard, Lee A (INPO)
Subject: TEPCO ENGINEER TO ENGINEER TALKS GOING ON RIGHT NOW

AH HA moments occurring on both sides. This is productive.
Al

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mail, please notify the sender immediately by return e-mail and permanently delete the original and any copy or printout of this e-mail and any attachments.
Thank you.

Bano, Mahmooda

From: Hochevar, Albert R. (INPO) [HochevarAR@INPO.org]
Sent: Tuesday, April 05, 2011 2:28 AM
To: Scott, Michael
Subject: RE: TEPCO ENGINEER TO ENGINEER TALKS GOING ON RIGHT NOW

Mike,

Did not have a chance to thank you in person. Safe travels home.

Al

From: Scott, Michael [mailto:Michael.Scott@nrc.gov]
Sent: Tuesday, April 05, 2011 3:26 PM
To: Hochevar, Albert R. (INPO); Blamey, Alan; Miller, Marie; Giessner, John; Bernhard, Rudolph; Salay, Michael
Cc: Gard, Lee A (INPO)
Subject: RE: TEPCO ENGINEER TO ENGINEER TALKS GOING ON RIGHT NOW

I believe that in Japan those are "Ah so" moments. ☺ Glad it's going well.

Mike

From: Hochevar, Albert R. (INPO) [mailto:HochevarAR@INPO.org]
Sent: Tuesday, April 05, 2011 2:16 AM
To: Blamey, Alan; Scott, Michael; Miller, Marie; Giessner, John; Bernhard, Rudolph; john.monniger@nrc.gov; Salay, Michael
Cc: Gard, Lee A (INPO)
Subject: TEPCO ENGINEER TO ENGINEER TALKS GOING ON RIGHT NOW

AH HA moments occurring on both sides. This is productive.
Al

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Thank you.

PPPP/144

From: Oudinot, Daniele
Sent: Tuesday, April 05, 2011 10:26 AM
To: Heida, Bruce
Cc: Klein, Alex
Subject: RE: ACTION: FOIA 2011-0147
Attachments: Tableau de synthèse DP_21 mars à 12h.doc; Translation of Tableau de synthèse DP_21 mars à 12h.doc

On 3/21/11, Victor Hall and I translated a text from the French "Institut de Radioprotection et de Surete Nucleaire." The original French document and our translation (attached) fall within the dates of the FOIA request. I received the green light to release these documents from Steve Dembeck, the OIP BC who made the request for the translation.

Question: Does the FOIA also require to include the flurry of emails that were exchanged when Steve Dembeck was looking for someone to do the translation

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From: *Heida, Bruce*
Sent: *Monday, April 04, 2011 12:49 PM*
To: NRR_DRA Distribution
Subject: FW: ACTION: FOIA 2011-0147
Importance: High

Correction. This should read AP FOIA instead of MSNBC FOIA.

Bruce

From: Heida, Bruce
Sent: Monday, April 04, 2011 12:12 PM
To: NRR_DRA Distribution
Subject: FW: ACTION: FOIA 2011-0147
Importance: High

Please see the attached FOIA. Please note that this is slightly different from the MSNBC FOIA. This is requesting all documents, not just correspondence, from March 11 through March 24. Correspondence submitted as part of the MSNBC FOIA do not have to be re-submitted.

Please forward any records you may have to me. I will print the records and pass them on to Patti Craver.

Thank you,

Bruce Heida
US NRC
NRR/DRA
(301) 415-3221

From: Craver, Patti
Sent: Thursday, March 31, 2011 12:16 PM
To: Titus, Brett; Cusumano, Victor; Roquecruz, Carla; Scales, Kerby; Cartwright, William; Meighan, Sean; Heida, Bruce; Nguyen, Quynh; Wertz, Trent
Cc: Ruland, William; Lubinski, John; Hiland, Patrick; Cheok, Michael; Nelson, Robert; Westreich, Barry; Leeds, Eric;

PPPP\145

Craver, Patti
Subject: ACTION: FOIA 2011-0147
Importance: High

Good Afternoon,

NRR along with NMSS, NRO, EDO, NSIR, OCA, OIP, OPA, RES, SECY and the Regions have been assigned this FOIA request from Greenpeace seeking records regarding the ongoing nuclear crisis in Japan, including but not limited to any and all information on the status of the damage to reactors and spent fuel pools at the Fukushima Daiichi nuclear plant and the resulting release of radiation.

This request covers all records relating to the ongoing Nuclear crisis in Japan from March 11th thru March 24, 2011. You do not need to produce records that are covered by previous FOIA requests.

This request has been granted a fee waiver. Therefore, NO estimates are required.

Please provide me your response by April 12, 2011. I will type up the appendices, so you just need to provide me your records and let me know what can be released and what needs to be withheld. Harm statements will be needed if the reason to withhold is not obvious.

Please let me know if you have any questions.

Charge your time to TAC ZF0001.

Thanks so much,
Patti Craver
FOIA Coordinator
Infrastructure Services Branch
Program Management, Policy Development
and Analysis Staff
Office of Nuclear Reactor Regulation
(301) 415-1513
patti.craver@nrc.gov

DIAGNOSTIC/PRONOSTIC - FUKUSHIMA I - 28/04/2011 12h00 (CTC)

ÉTAT DES RÉACTEURS ET DE LEUR ENCEINTE DE CONFINEMENT

	Réacteur n°1	Réacteur n°2	Réacteur n°3	Réacteur n°4	Réacteur n°5	Réacteur N°6
État du cœur Nota : Les valeurs indiquées sont celles issues de capteurs non qualifiés AG	70% d'endommagement (TEPCO) cœur partiellement dénoyé (-1,75 m/ -1,8 m) P_{cuve} = 2,95 b abs (A), 2,59 b abs (B) (21/03 à 05:00 H.jap)	33% d'endommagement (TEPCO) - cœur partiellement dénoyé (-1,35 m) P_{cuve} = 0,83 b abs (A), 0,81 b bas (B) (21/03 à 03:00 H.jap)	Cœur endommagé - cœur partiellement dénoyé (-1,65 m / -1,95 m) P_{cuve} = 3,15 b abs (B), (21/03 à 04:00 H.jap) pression en hausse après une première baisse (pb d'évacuation de la puissance dans la cuve)	Cœur déchargé confirmé	Réacteur en arrêt à froid, pas de dégradation du cœur P_{cuve} = 2,48 b abs Niveau cuve : 2,5 m (20/03 à 16:00 H.jap)	Réacteur en arrêt à froid, pas de dégradation du cœur P_{cuve} = 7,91 b abs Niveau cuve : 2,4 m (20/03 à 16:00 H.jap)
Nb assemblages	400	548	548 (dont 32 MOX)	Capacité : 548	Capacité : 548	Capacité : 764
P. résiduelle	3,9	6,4	6,4		-	-
Injection en cuve	Injection d'eau de mer en cuve en service via ligne incendie mais débit faible à cause de la pression élevée dans la cuve	Injection d'eau de mer en cuve en service via ligne incendie	Injection d'eau de mer en cuve en service via ligne incendie mais débit faible à cause de la pression élevée dans la cuve		Pas nécessaire (20/03 à 16:00)	Pas nécessaire (20/03 à 16:00)
Injection enceinte	Injection en cours (20/03 à 22:00 H.jap)	Prévue (20/03 à 22:00 H.jap)	Injection en cours (20/03 à 22:00 H.jap)			
Enceinte de Confinement (intégrité)	Intègre	Dommages enceinte suspectés (tore ?)	Doute car baisse de pression inexpliquée		Intègre (pas d'information)	Intègre (pas d'information)
Pression enceinte Nota : valeurs issues de capteurs non qualifiés AG	1,6 b abs (stable - 21/03 à 05h00 H jap)	1,2 b abs (stable - 21/03/11 à 03h00)	1,6 b abs : (21/03 à 04:00 - en baisse depuis le pic de 3,4 b abs à 4h30)		(pas d'information)	(pas d'information)
Évacuation puissance enceinte	Pas d'éventage prévu	Pas d'éventage prévu	Décision de ne pas éventer l'enceinte (info NHK 21/03 2h42 H jap)			

État du bâtiment	Explosion le 12/03/11 Bardage soufflé. Structures métalliques et béton a priori encore intègres Fuite suspectée au niveau de la piscine A CONFIRMER. (source Ambassade Message 832) Enceinte intègre	Explosion le 15/03/11 Bardage presque complètement intègre, excepté deux trous consécutifs à l'explosion sur la Tr3. Structures métalliques et béton a priori encore intègres Pas de remise en cause des structures de la piscine Emission de fumée blanche vers 18 :20	Explosion le 14/03/11 Stabilité des structures pourrait être remise en cause en cas de réplique sismique/largage d'eau Disparition du plancher de service vers la tranche 2 jusqu'au droit du puits de l'enceinte de confinement. Plancher du niveau inférieur effondré sur environ 10m Diminution du volume des piscines probable Emission d'une fumée noire au niveau du toit le 21/03 de 15 :55 à 18 :00	Explosion H2 suite à radiolyse de l'eau Toit endommagé Bardage périphérique dégradé Maçonnerie périphérique inférieure touchée Stabilité structures rigides supposée Risque en cas de réplique sismique pas de dommage important visible depuis la façade opposée à la Tr 3	Brèche volontaire dans la toiture pour éviter explosion H2	Brèche volontaire dans la toiture pour éviter explosion H2
Alimentations électriques	Alim externe connectée aux tableaux de distribution unités 1 et 2 (JAIF 20/03/11 22h00), alimentation non effective	Alim externe connectée aux tableaux de distribution unités 1 et 2 (JAIF 20/03/11 22h00), alimentation des tableaux prévue dans l'après-midi du 21/03	Indisponibles Réalimentation électrique (lignes HT) prévue le 21 mars	Indisponibles Réalimentation électrique (lignes HT) prévue le 21 mars	Utilisation d'un groupe électrogène de la tranche 6, utilisé en priorité pour refroidir la piscine via le les pompes du système RHR. (20/03 à 22h30 H.jap) Réalimentation électrique (lignes HT) effective	Un 2ème groupe électrogène sur la tranche 6 démarré le 19/03 à 04h20 et utilisé pour refroidir la piscine, via le système RHR (20/03 à 22h30 H.jap) Réalimentation électrique (lignes HT) effective
Salle de commande	Salle de commande jumelle Tr1 et Tr2 Irradiation importante conduisant à un accès limité. TEPCO espère rétablir une alimentation de la SDC (20/03 à 19:00).		Salle de commande jumelle Tr3 et Tr4 Irradiation importante conduisant à un accès limité		Utilisable (20/03 à 19:00)	Utilisable (20/03 à 19:00)

Analyse des risques (pronostic aggravé)

Risque de cristallisation du sel *(le passage rapide à l'injection d'eau douce est à recommander).*

Pour les réacteurs n°1, 2 et 3, il y a risque de cristallisation du sel en cuve à partir du 23/03/2011. Les conséquences sur le refroidissement du cœur sont inconnues : plus 40 t de sel seront présents dans la cuve, ce qui représenterait une hauteur de 2 à 3 m en cas de dépôt en fond de cuve (le combustible est à 6 m).
Le sel pourrait aussi entrainer des blocages de soupapes pouvant empêcher l'injection d'eau en cuve (non quantifiable).

En cas de perte de l'injection d'eau en cuve (réacteurs 1, 2, et 3)*, risque de reprise de la dégradation du cœur pouvant entraîner la relocalisation du corium en fond de cuve :*
-avec le puits de cuve sec, des études américaines montrent une percée de la cuve puis, rapidement la percée du liner de l'enceinte. Déchargement des gaz (vapeur, H2, CO) dans les bâtiments. Une nouvelle combustion menacerait leur intégrité (bâtiments 1 et 2 surtout car peu endommagés en partie basse). Les piscines pourraient être endommagées également.
- avec le puits de cuve rempli d'eau (situation actuelle), risque d'explosion de vapeur et de défaillance de l'enceinte. La relocalisation du cœur dans le puits de cuve devrait entraîner rapidement la percée du liner (voir ci-dessus pour la suite).

Réplique d'un séisme et impact sur les structures et notamment les piscines.
Compte tenu de l'état des bâtiments 1, 2, 3 et 4, une réplique de séisme pourrait aggraver l'état actuel des piscines et provoquer des fuites (non quantifiable).

Risque de criticité dans les piscines
Possible en cas de forte déformation des râteliers d'entreposage (ce n'est manifestement pas le cas actuellement) ou après dégradation des assemblages (suite à un dénoyage piscine) entrainant la formation et le regroupement de débris (50 kg d'uranium en première approximation).
A priori, un retour en criticité ne conduirait pas à un phénomène explosif. Un phénomène périodique pourrait s'installer pendant l'ébullition de la piscine.
En conclusion, ce risque concerne les situations de renoyage tardif sur un combustible dégradé.

Radiolyse de l'eau et production d'hydrogène associé
Phénomène lent mais à considérer pour la gestion long terme de l'accident (concerne les enceintes de confinement si elles ne sont plus éventées et les piscines).

Production de débris dans l'enceinte

Suivant les matériaux dans l'enceinte de confinement, sous l'effet de l'irradiation, des dégradations de matériau pourraient survenir et former des débris pouvant obstruer les lignes de décharge.

Défaillances en cascade
Une nouvelle aggravation de la situation entrainant des rejets et limitant l'accessibilité du site (piscine N°3 dénoyée par exemple) pourrait entrainer une cascade de défaillances supplémentaires suite à l'évacuation du site.

DIAGNOSTIC/PRONOSTIC - FUKUSHIMA I -28/04/2011- 12h00

ÉTAT DES PISCINES[1]

	Piscine 1	Piscine 2	Piscine 3	Piscine 4	Piscine 5	Piscine 6	Piscine commune
Nbre d'assemblages en piscine	292 usés 100 neufs	587 usés 28 neufs	514 usés 52 neufs	783 usés 204 neufs 548 irradiés	946 usés 48 neufs	876 usés 64 neufs	6375
Puissance résiduelle	0,51 MW (estimation IRSN)	0,93 MW (estimation IRSN)	0,83 MW (estimation IRSN)	3,73 MW (estimation IRSN)	2,35 MW (estimation IRSN)	1,21 MW (estimation IRSN)	Estimation IRSN à affiner : 1,5 MW
Refroidissement	Non assuré Injection à prévoir (20/03 à 16:00)	Non assuré Absence de vaporisation visible le matin du 20/03. Injection d'eau de mer de 15h00 à 17h20 le 20/03 (40 tonnes)	Non assuré Du 19 mars 14h10 au 20 mars 3h40 : 2000 tonnes d'eau projetées 2nd opération : du 20/03 21h30 au 21/03 4h00 : 1100 tonnes projetées	Non assuré Le 20 mars, 180 tonnes projetées. Le 21 mars de 6h40 à 8h40 : 90 tonnes projetées sur le bâtiment.	Refroidissement en cours (alimenté par diesel) - connexion réseau prévue Température : 21/03/11 à 05:00 : 39.5°C (en légère hausse 35.1 °C le 20/03 à 16h00)	Refroidissement en cours (alimenté par diesel) - connexion réseau prévue Température : 21/03/11 à 05:00 : 32°C (en légère hausse 28 °C le 20/03 à 16h00)	Refroidissement non confirmé mais TEPCO confirme que le niveau est satisfaisant (20/03 à 16 :00) 57°C le 19/03 à 9h00 (H Jap) (NISA n°37 du 20/03 à 22h30)
Pronostic : **Délai de découvrement (sans appoint)**	Supérieur à 1 mois sans fuite Supérieur à 20 jours avec une baisse de niveau de 4 mètres du à une fuite éventuelle	Supérieur à 20 jours	Piscine en débordement	Supérieur à 10 jours	Plus de risque d'ébullition	Plus de risque d'ébullition	**Avant le début du découvrement :** > 1 mois

[1] Complété suite à l'examen des photos satellites

TERMES SOURCES

	Réacteurs 1 - 2 - 3 TS n°22 Terme source diagnostic réaliste avec bouffées multiples + ouverture enceinte au 16/03/2011	Réacteurs 1 - 2 - 3 TS n°33 Terme source diagnostic réaliste avec bouffées multiples réévalué au 20/03/2011	**Piscine n°3** TS message n°806 Terme source piscine - 514 assemblages - dernier rechargement à 3 mois - rejet sur 10 jours	*Tchernobyl*	*« S3 » EDF U5 à 24h et 24h de rejet*
Gaz Rares	$3.72\ 10^{+18}$	$1.25\ 10^{+18}$	$1,94\ 10^{+16}$	*$6,53\ 10^{+18}$*	*$5,4\ 10^{+18}$*
Cs	$5.91\ 10^{+16}$	$2.72\ 10^{+16}$	$3,66\ 10^{+17}$	*$1,68\ 10^{+17}$*	*$4,2\ 10^{+13}$*
Te	$2.29\ 10^{+17}$	$1.28\ 10^{+17}$	$6\ 10^{+15}$	*$1,39\ 10^{+18}$*	*$1,4\ 10^{+14}$*
I	$4.61\ 10^{+17}$	$2.64\ 10^{+17}$	0	*$4,26\ 10^{+18}$*	*$2,06\ 10^{+16}$*
Sr			$3,5\ 10^{+16}$	*$1,2\ 10^{+17}$*	
Ru			$3,4\ 10^{+17}$	*$2,41\ 10^{+17}$*	
Y 91			$5,75\ 10^{+14}$		
Zr 95			$1,03\ 10^{+15}$		
Ce 144			$1,44\ 10^{+16}$		
Nb 95			$8,3\ 10^{+15}$		

ESTIMATIONS DE CONSÉQUENCES

	Valeur Japon	Dose efficace à 4j (météo en pronostic)	Dose efficace à 4j (météo tirée des observations)	CR à 24h	*Tchernobyl Conséquences totales*	*« S3 » Conséquences à 24h*
Evacuation	50 mSv	15 km	16 km	35 km	30 km	6 km (DN5)
Mise à l'abri	10 mSv	30 km	35 km	80 km		11 km (DN5)
Thyroïde	100 mSv	35 km	33 km	s.o.		18 km (DN5)
Longue distance	Tokyo - centre		Thyroide : 0,1 à 1 mSv ; Efficace : 0,01 à 0.1 mSv			

ÉVALUATION DES TERMES SOURCES DES PISCINES 1 À 6

Les taux de relâchement et de dépôt retenus sont :

PF	Taux de relâchement des PF du combustible vers la piscine (1)	Taux de dépôt des PF relâchés dans la piscine (2)	Taux de relâchement à l'atmosphère depuis la piscine (1)*(1. - (2))
GR	100	0	100
I	100	0	100
Te	100	30	70
Cs	95	10	85,5
Sr	35	50	17,5
Ba	100	50	50
Ru	-	-	50 (*)
Rh	50	80	10
Y	1	48	0,52
Zr	1	48	0,52
Nb	10	80	2
Ce	5	80	1

(*) Valeur imposée à 50 %

	Piscine 1	Piscine 2	Piscine 3	Piscine 4	Piscine 5	Piscine 6
Nbre AC	292 + 100	585 + 28	514 + 52	548 + 783 + 200	946 + 48	876 + 64
temps refroidissement	1 an + neufs	6 mois + neufs	9 mois + neufs	3 mois + > 12 mois + neufs	3 mois + neufs	6 mois + neufs
élément	pour les AC stockés	pour les AC stockés	pour les AC stockés	pour les AC stockés	pour les AC stockés	Pour les AC stockés
Xe133F	2,953E-03	2,204E+08	1,119E+03	3,550E+13	6,126E+13	3,306E+08
Xe131M	1,923E+07	1,981E+12	8,579E+09	3,585E+14	6,181E+14	2,971E+12
Kr85F	8,722E+15	2,256E+16	1,941E+16	5,050E+16	3,690E+16	3,384E+16
I131	2,324E+04	3,962E+11	1,328E+08	9,682E+14	1,664E+15	5,942E+11
Cs134F	7,938E+16	2,352E+17	1,891E+17	5,038E+17	4,117E+17	3,527E+17
Cs137	8,016E+16	2,031E+17	1,766E+17	4,587E+17	3,287E+17	3,046E+17
Cs136F	2,222E+08	8,317E+12	5,949E+10	9,471E+14	1,637E+15	1,248E+13
Te125M	9,890E+14	2,476E+15	2,293E+15	5,929E+15	4,526E+15	4,130E+15
Te127F	8,419E+14	6,729E+15	3,294E+15	1,405E+16	1,935E+16	1,009E+16
Te127M	8,595E+14	3,026E+15	3,363E+15	1,435E+16	1,979E+16	1,030E+16
Te129M	2,800E+13	7,011E+13	3,294E+15	1,865E+16	3,199E+16	4,538E+15
Te129F	1,822E+13	1,970E+15	2,622E+14	1,215E+16	2,083E+16	2,954E+15
Sr89	1,149E+15	3,523E+16	8,806E+15	1,189E+17	1,984E+17	5,285E+16
Sr90	1,192E+16	3,020E+16	2,626E+16	6,820E+16	4,890E+16	4,530E+16
Ba137M	4,439E+16	1,124E+17	9,778E+16	2,538E+17	1,820E+17	1,687E+17
Ba140	2,152E+09	1,101E+14	6,736E+11	1,470E+16	2,532E+16	1,651E+14
Rh103M	2,530E+14	1,578E+16	2,764E+15	7,429E+16	1,267E+17	2,366E+16
Rh106F	2,519E+16	8,832E+16	6,515E+16	1,816E+17	1,685E+17	1,325E+17
Ru103	1,267E+15	7,898E+16	1,384E+16	7,785E+16	6,343E+17	1,185E+17
Ru106	1,255E+17	4,416E+17	3,258E+17	5,168E+17	8,426E+17	6,624E+17
Y91	8,888E+13	1,934E+15	5,737E+14	5,618E+15	9,174E+15	2,901E+15
Y90F	3,551E+14	8,977E+14	7,818E+14	2,030E+15	1,454E+15	1,348E+15
Zr95	3,542E+14	6,054E+17	1,024E+15	2,026E+15	1,361E+16	4,721E+15
NB95	1,455E+15	1,196E+18	8,322E+15	2,790E+18	8,782E+16	3,588E+16
CE144	5,285E+15	2,063E+16	1,445E+16	4,170E+16	4,146E+16	3,094E+16
Mesures de protection - Dose efficace à l'adulte à 7 jours						
Mise à l'abri (10 mSv)	46 km	120 km	72 km	160 km	132 km	108 km
Evacuation (50 mSv)	20 km	49 km	34 km	60 km	51 km	46 km
Calcul longue distance Piscine 3	Tokyo : dose efficace entre 0,1 et 1 mSv, dose thyroïde entre 0,01 et 0,1 mSv, débit de dose 10 µGy/h (Météo défavorable)					

DIAGNOSTIC/PROGNOSTIC - FUKUSHIMA I - 28/04/2011 12:00 pm (CTC)

REACTOR AND CONTAINMENT STATUS

	Reactor n°1	Reactor n°2	Reactor n°3	Reactor n°4	Reactor n°5	Reactor N°6
Status of the core Note : The values are quoted from non-AG qualified sensors	70% damage (TEPCO) core partially uncovered (-1,75 m/ -1,8 m) P_{RPV} = 2,95 b abs (A), 2,59 b abs (B) (03/21 at 5:00 am Japan time)	33% damage (TEPCO) - core partially uncovered (-1,35 m) P_{RPV} = 0,83 b abs (A), 0,81 b bas (B) (03/21 at 3:00 am Japan time)	Core damaged - core partially uncovered (-1,65 m / -1,95 m) P_{RPV} = 3,15 b abs (B), (03/21 at 4:00 am Japan time) pressure rising after initial drop (problem releasing energy in the reactor pressure vessel)	Confirmed core defueled	Reactor in cold shutdown, no core damage P_{RPV} = 2,48 b abs Reactor pressure vessel level: 2,5 m (03/20 at 4:00 pm Japan time)	Reactor in cold shutdown, no core damage P_{RPV} = 7,91 b abs Niveau cuve : 2,4 m (03/20 at 4:00 pm Japan time)
No. assemblies	400	548	548 (32 MOX)	Capacity : 548	Capacity : 548	Capacity : 764
Residual P.	3,9	6,4	6,4		-	-
RPV injection	Sea water injection into RPV through fire header but weak flow due to high RPV pressure	Sea water injection into RPV through fire header	Sea water injection into RPV through fire header due to high RPV pressure		Not necessary (03/20 at 4:00 pm)	Not necessary (03/20 at 4:00 pm)
Containment injection	Ongoing injection (03/20 at 10:00 pm Japan time)	Planned (03/20 at 10:00 pm Japan time)	Ongoing injection (03/20 at 10:00 pm Japan time)			
Containment (integrity)	Intact	Damage to continment suspected (torus ?)	Uncertain due to unexplained pressure drop		Intact (no information)	Intact (no information)
Containment pressure Note: values quoted from non-AG qualified sensors	1,6 b abs (stable - 03/21 at 5:00 am Japan time)	1,2 b abs (stable - 03/21 at 3:00 am)	1,6 b abs : (03/21 at 4:00 am - declining after a peak of 3,4 b abs at 4:30 am)		(no information)	(no information)
Containment pressure relief	No planned pressure relief	No planned pressure relief	Decision not to release pressure (info NHK 03/21 2:42 am Japan time)			

Status of reactor building	Explosion on 03/12/11 Secondary containment metal covering blown off. Metal frame and concrete thought to be intact Leak suspected in spent fuel pool TO BE CONFIRMED (Source: Embassy message 832) Containment intact	Explosion on 03/15/11 Secondary contaiment almost completely intact, except 2 holes from consecutive explosions on Unit 3 Metal frame and concrete thought to be intact No reconsideration of spent fuel pool integrity Emission of white smoke around 6 :20 pm	Explosion on 03/14/11 Stability of structures could be in question in the case of aftershocks/water loss Collapse of service floor towards Unit 2. Lower level collapsed to about 10m. Lower water levels in spent fuel pool probable Emission of black smoke at the roof on 03/21 from 3:55 pm to 6:00 pm	Hydrogen explosion following radiolysis of water Roof damaged Secondary containment degraded Building covering affected Stability of rigid structures presumed Risk in case of aftershocks No significant damage visible due to Unit 3 explosion	Hole cut in roof to avoid hydrogen explosion	Hole cut in roof to avoid hydrogen explosion
Power supplies	External power connected to units 1 and 2 switchyard (JAIF 03/20/11 10:00 pm), Supply inoperative	External power connected to units 1 and 2 switchyard (JAIF 03/20/11 10:00 pm), power planned in afternoon of 03/21	Not available Re-connection of high-tension lines planned for March 21	Not available Re-connection of high-tension lines planned for March 21	Use of Unit 6 generator, being prioritized to cool spent fuel pool via RHR pumps.(03/20 at 10:30 pm Japan time) Re-connection of high-tension lines successful	2nd generator on unit 6 started on 03/19 at 04:20 am and used to cool spent fuel pool via RHR system (03/20 at 10:30 pm Japan time) Re-connection of high-tension lines successful
Control room	Units 1 and 2 shared control room Significant radioactive activity restricts access. TEPCO hopes to re-establish control room supply (03/20 at 7:00 pm).		Units 3 and 4 shared control room Significant radioactive activity restricts access.		Operable (03/20 at 7:00 pm)	Operable (03/20 at 7:00 pm)

Risk analysis (worst case scenario)

Risk of salt crystallization *(Rapid switching to fresh water injection is to be recommended.*

For reactors 1, 2, and 3, there is a salt crystallization risk in the reactor vessel starting on 3/23/2011. The consequences on core cooling are unknown: more than 40 tons of salt will be in pressure vessel, which translates into a height of 2 to 3 m if it is deposited at the bottom of the vessel (the fuel is at 6m).
The salt could also cause valve blockages, preventing injection of water into the vessel (non quantifiable).

In the case of loss of water injection to the vessel (Units 1, 2, and 3)*, risk of further damage to the core, which could result in displacement of corium to the bottom of the vessel:*
-in case of a dry vessel, American studies show a breach of the vessel, followed by the rapid breach of the containment liner. Gas release (steam, hydrogen, CO) in the reactor building. A new combustible would threaten their integrity (especially buildings 1 and 2, because they have suffered little damage in lower levels.) The spent fuel pools could also be damaged.
-in case of a water-filled vessel (actual situation), risk of steam explosion and failure of containment. The displacement of the core in the vessel pit should cause rapid breach of the liner (see above)

Aftershock and its impact on the structures, in particular on the spent fuel pools.
Given the condition of the buildings of Units 1, 2, 3, and 4, an aftershock could worsen the condition of the spent fuel pools and could cause releases (non quantifiable).

Risk of criticality in the spent fuel pools.
Possible in the case of extensive deformation of the fuel racks (currently not the case) or after fuel assembly damage (following loss of all water in the spent fuel pool) resulting in formation of clusters of debris (first approximation at 50 kg of uranium)
A return to criticality would likely not cause an explosion. A reoccurring phenomenon could occur during boiling in the spent fuel pool.
In conclusion, this risk applies to delayed covering of damaged fuel.

Radiolysis of water and resulting production of hydrogen.
Slow phenomenon, but to be considered for the long term management of the accident (applies to the containments if they are no longer vented, and to the spent fuel pools)

Resulting debris in the containment.
Depending on what materials are in the containment, the effects of radiation could cause degradation and cause formation of debris, which could obstruct the discharge lines.

Cascading failures.
Further worsening of the situation causing radioactive releases and limiting access to the site (e.g. Unit 3 spent fuel pool) could result in a cascade of additional failures after a site evacuation.

DIAGNOSTIC/PROGNOSTIC - FUKUSHIMA I -28/04/2011- 12:00 pm

STATUS OF SPENT FUEL POOLS[1]

	Pool 1	Pool 2	Pool 3	Pool 4	Pool 5	Pool 6	Common pool
No. of assemblies in spent fuel pool	292 used 100 new	587 used 28 new	514 used 52 new	783 used 204 new 548 irradiated	946 used 48 new	876 used 64 new	6375
Residual power	0,51 MW (IRSN estimation)	0,93 MW (IRSN estimation)	0,83 MW (IRSN estimation)	3,73 MW (IRSN estimation)	2,35 MW (IRSN estimation)	1,21 MW (IRSN estimation)	IRSN estimation to be revised: 1,5 MW
Cooling	Not available Injection will be planned (03/20 at 4:00 pm)	Not available No visible steam on the morning of 03/20 Injection of sea water from 3:00 pm to 5:20 pm on 03/20 (40 tons)	Not available From March 19 02:10pm to March 20 03:40 am: 2000 tons of water sprayed 2nd operation: from 03/20 9:30 pm to 03/21 4:00 am: 1100 tons sprayed	Not available 180 tons sprayed on March 20. On March 21 from 6:40am to 8:40am: 90 tons sprayed on the building.	Cooling ongoing (powered by diesel) - connection to grid planned Temperature: 03/21/11 at 5:00 am: 39.5°C (rising slightly - 35.1 °C on 03/20 at 4:00 pm)	Cooling ongoing (powered by diesel) - connection to grid planned Temperature: 03/21/11 at 05:00 am: 32°C (rising slightly - 28 °C on 03/20 at 4:00 pm)	Cooling not confirmed, but TEPCO confirms that the level is satisfactory (03/20 at 04:00 pm) 57°C on 03/19 at 9:00 am (Japan time) (NISA n°37 of 03/20 at 10:30 pm)
Prognostic: **Time to uncovering (without action)**	Over one month if no leak Over 20 days with a 4-meter level loss due to an eventual leak	Over 20 days	Spent fuel pool overflowing	Over 10 days	No risk of boiling	No risk of boiling	**More than one month before uncovering fuel**

[1] Completed following review of satellite photos

SOURCE TERMS

	Reactors 1 - 2 - 3 TS n°22 Realistic source term diagnostic with multiples plumes + breached containment on 03/16/2011	Reactors 1 - 2 - 3 TS n°33 Realistic source term diagnostic with multiples plumes reevaluated on 03/20/2011	**Pool n°3** TS message n°806 Source term pool - 514 assemblies - last refueling at 3 months - exposure over 10 days	*Chernobyl*	*« S3 » EDF U5 at 24 hours and 24 hours of exposure*
Rare Gasses	$3.72\ 10^{+18}$	$1.25\ 10^{+18}$	$1,94\ 10^{+16}$	*$6,53\ 10^{+18}$*	*$5,4\ 10^{+18}$*
Cs	$5.91\ 10^{+16}$	$2.72\ 10^{+16}$	$3,66\ 10^{+17}$	*$1,68\ 10^{+17}$*	*$4,2\ 10^{+13}$*
Te	$2.29\ 10^{+17}$	$1.28\ 10^{+17}$	$6\ 10^{+15}$	*$1,39\ 10^{+18}$*	*$1,4\ 10^{+14}$*
I	$4.61\ 10^{+17}$	$2.64\ 10^{+17}$	0	*$4,26\ 10^{+18}$*	*$2,06\ 10^{+16}$*
Sr			$3,5\ 10^{+16}$	*$1,2\ 10^{+17}$*	
Ru			$3,4\ 10^{+17}$	*$2,41\ 10^{+17}$*	
Y 91			$5,75\ 10^{+14}$		
Zr 95			$1,03\ 10^{+15}$		
Ce 144			$1,44\ 10^{+16}$		
Nb 95			$8,3\ 10^{+15}$		

ESTIMATION OF CONSEQUENCES

	Value Japan	Effective dose at 4 days (anticipated weather forecast)	Effective dose at 4 days (weather forecast from observations)	Radioactive consequences at 24 hours	*Total Chernobyl consequences*	*« S3 » Consequences at 24h*
Evacuation	50 mSv	15 km	16 km	35 km	30 km	6 km (DN5)
Shelter in place	10 mSv	30 km	35 km	80 km		11 km (DN5)
Thyroid	100 mSv	35 km	33 km	s.o.		18 km (DN5)
Long distance	Tokyo - center		Thyroid : 0,1 to 1 mSv ; Effective: 0,01 to 0.1 mSv			

SOURCE TERM EVALUATION OF UNITS 1 TO 6 SPENT FUEL POOLS

The release and deposit rates are:

Fission products	Release rates of fuel fission products towards the spent fuel pool (1)	Deposit rates of fission products released in the spent fuel pool (2)	Release rates to the atmosphere from the spent fuel pool (1)*(1. - (2))
GR	100	0	100
I	100	0	100
Te	100	30	70
Cs	95	10	85,5
Sr	35	50	17,5
Ba	100	50	50
Ru	-	-	50 (*)
Rh	50	80	10
Y	1	48	0,52
Zr	1	48	0,52
Nb	10	80	2
Ce	5	80	1

(*) Value imposed at 50%

	Pool 1	Pool 2	Pool 3	Pool 4	Pool 5	Pool 6
Number of assemblies	292 + 100	585 + 28	514 + 52	548 + 783 + 200	946 + 48	876 + 64
Cooling time	1 year + new	6 months + new	9 months + new	3 months + > 12 months + new	3 months + new	6 months + new
Element	Stored assemblies	Stored assemblies	Stored assemblies	Stored assemblies	Stored assemblies	Stored assemblies
Xe133F	2,953E-03	2,204E+08	1,119E+03	3,550E+13	6,126E+13	3,306E+08
Xe131M	1,923E+07	1,981E+12	8,579E+09	3,585E+14	6,181E+14	2,971E+12
Kr85F	8,722E+15	2,256E+16	1,941E+16	5,050E+16	3,690E+16	3,384E+16
I131	2,324E+04	3,962E+11	1,328E+08	9,682E+14	1,664E+15	5,942E+11
Cs134F	7,938E+16	2,352E+17	1,891E+17	5,038E+17	4,117E+17	3,527E+17
Cs137	8,016E+16	2,031E+17	1,766E+17	4,587E+17	3,287E+17	3,046E+17
Cs136F	2,222E+08	8,317E+12	5,949E+10	9,471E+14	1,637E+15	1,248E+13
Te125M	9,890E+14	2,476E+15	2,293E+15	5,929E+15	4,526E+15	4,130E+15
Te127F	8,419E+14	6,729E+15	3,294E+15	1,405E+16	1,935E+16	1,009E+16
Te127M	8,595E+14	3,026E+15	3,363E+15	1,435E+16	1,979E+16	1,030E+16
Te129M	2,800E+13	7,011E+13	3,294E+15	1,865E+16	3,199E+16	4,538E+15
Te129F	1,822E+13	1,970E+15	2,622E+14	1,215E+16	2,083E+16	2,954E+15
Sr89	1,149E+15	3,523E+16	8,806E+15	1,189E+17	1,984E+17	5,285E+16
Sr90	1,192E+16	3,020E+16	2,626E+16	6,820E+16	4,890E+16	4,530E+16
Ba137M	4,439E+16	1,124E+17	9,778E+16	2,538E+17	1,820E+17	1,687E+17
Ba140	2,152E+09	1,101E+14	6,736E+11	1,470E+16	2,532E+16	1,651E+14
Rh103M	2,530E+14	1,578E+16	2,764E+15	7,429E+16	1,267E+17	2,366E+16
Rh106F	2,519E+16	8,832E+16	6,515E+16	1,816E+17	1,685E+17	1,325E+17
Ru103	1,267E+15	7,898E+16	1,384E+16	7,785E+16	6,343E+17	1,185E+17
Ru106	1,255E+17	4,416E+17	3,258E+17	5,168E+17	8,426E+17	6,624E+17
Y91	8,888E+13	1,934E+15	5,737E+14	5,618E+15	9,174E+15	2,901E+15
Y90F	3,551E+14	8,977E+14	7,818E+14	2,030E+15	1,454E+15	1,348E+15
Zr95	3,542E+14	6,054E+17	1,024E+15	2,026E+15	1,361E+16	4,721E+15
NB95	1,455E+15	1,196E+18	8,322E+15	2,790E+18	8,782E+16	3,588E+16
CE144	5,285E+15	2,063E+16	1,445E+16	4,170E+16	4,146E+16	3,094E+16
Safety measures - Effective Dose to an adult at 7 days						
Shelter in place (10 mSv)	46 km	120 km	72 km	160 km	132 km	108 km
Evacuation (50 mSv)	20 km	49 km	34 km	60 km	51 km	46 km
Long distance calculation Pool 3	Tokyo: effective dose between 0,1 et 1 mSv, thyroid dose between 0,01 et 0,1 mSv, dose rate 10 µGy/h (unfavorable weather conditions)					

Translator's notes:

- Dates have been changed to U.S. standard (mm/dd/yy)
- Other units were left in S.I. units. This includes the "tons" noted above, which are metric tons.
- Note that the European convention is to use a comma as a decimal mark (i.e. 2,2 mSv = 2.2 mSv)

From: LIA08 Hoc
Sent: Tuesday, April 26, 2011 12:26 PM
To: Andersen, James; Anderson, Joseph; Ash, Darren; Baggett, Steven; Barker, Allan; Batkin, Joshua; Boger, Bruce; Borchardt, Bill; Bradford, Anna; Brenner, Eliot; Breskovic, Clarence; Smith, Brooke; Brown, Frederick; Brown, Milton; Bubar, Patrice; Burns, Stephen; Camper, Larry; Carpenter, Cynthia; Castleman, Patrick; Ader, Charles; Murray, Charles; Casto, Chuck; Coggins, Angela; Collins, Elmo; ConE_Resource; Copeland, Douglas; Correia, Richard; Craffey, Ryan; Dapas, Marc; Dean, Bill; Decker, David; Diaz-Sanabria, Yoira; Dickman-Disabled-11/14/2010, Paul; Dorman, Dan; Droggitis, Spiros; Dyer, Jim; English, Lance; ET02 Hoc; Evans, Michele; Franovich, Mike; Frye, Timothy; Garmon, David; Apostolakis, George; Gibbs, Catina; Giitter, Joseph; Gott, William; Grobe, Jack; Hahn, Matthew; Haney, Catherine; Harrington, Holly; Hipschman, Thomas; Hoc, PMT12; Holahan, Gary; Holahan, Patricia; Holahan, Vincent; HOO Hoc; Howe, Allen; Howell, Art; Howell, Linda; Issa, Alfred; Itzkowitz, Marvin; Foster, Jack; Jackson, Donald; Jaczko, Gregory; Johnson, Andrea; Johnson, Michael; Jones, Cynthia; Kahler, Robert; King, Mark; Foggie, Kirk; Kock, Andrea; Kozal, Jason; Leeds, Eric; LIA08 Hoc; Logaras, Harral; Loyd, Susan; Magwood, William; Maier, Bill; Marshall, Jane; Marshall, Michael; McCree, Victor; McDermott, Brian; McIntosh, Angela; McNamara, Nancy; Michalak, Paul; Miller, Charles; Miller, Chris; Monninger, John; Morris, Scott; Nease, Rebecca; Nieh, Ho; NRCHQ; NSIR_DDSP_ILTAB_Distribution; Ordaz, Vonna; Orders, William; OST05 Hoc; Ostendorff, William; Pace, Patti; Patel, Jay; Pearson, Laura; Pederson, Cynthia; Plisco, Loren; Powell, Amy; Quichocho, Jessie; R1 IRC; R2 IRC; R3 IRC; R4 IRC; Reddick, Darani; Reyes, Luis; Devercelly, Richard; Riley (OCA), Timothy; Nelson, Robert; ROO hoc; Rothschild, Trip; RST01 Hoc; Satorius, Mark; Schmidt, Rebecca; Sharkey, Jeffry; Sheron, Brian; Sigmon, Rebecca; Snodderly, Michael; Sosa, Belkys; Speiser, Herald; Svinicki, Kristine; Tabatabai, Omid; Thoma, John; Thomas, Eric; Tifft, Doug; Kolb, Timothy; Ulses, Anthony; Nakanishi, Tony; Tracy, Glenn; Trapp; Trapp, James; Trojanowski, Robert; Turtil, Richard; Uhle, Jennifer; Virgilio, Martin; Warnick, Greg; Warren, Roberta; Weber, Michael; Westreich, Barry; Wiggins, Jim; Cook, William; Williams, Kevin; Wittick, Brian; Woodruff, Gena; Zimmerman, Roy; Zorn, Jason
Subject: USNRC Earthquake-Tsunami Update 042611 1200 EDT (Final email distrubution)
Attachments: USNRC Earthquake-Tsunami Update 042611 Revision 00, 1200 EDT.pdf; SharePoint Information Japan.pdf

*******NOTE: THE ATTACHED IS FOR OFFICAL USE ONLY********

The next NRC Update will be distributed at 1200 EDT on Wednesday, April 27, 2011

*******NOTE: THE ATTACHED IS FOR OFFICAL USE ONLY********

Per direction from the Executive Team, this will be the final USNRC Status Update sent via email to the internal distribution. Future updates will be loaded to the Japan SharePoint page at http://nsir-ops.nrc.gov/. You may subscribe to email alerts through the SharePoint page (instructions in 2nd attachment). Please let us know if you have any problems or questions. Thank you.

*** Attachments are OUO ***

Beth Reed
LT Coordinator

DPPP\ 146

Japan Earthquake/Tsunami Internal Information
SharePoint Website

To access the Japan SharePoint page, please visit http://nsir-ops.nrc.gov. Documents in this page are stored in document libraries which can be accessed from the links on the left side of the page. Since the transition to the 6-person response team, the only documents that are continually being updated are the Japan One-Pager, NRC Status Updates, DOE SitReps, and Press Releases (IAEA). These 4 document libraries are at the top of the "Documents" list on the left.

Documents will be posted routinely throughout the day. If you wish to receive a notification when a new document has been posted to a library, click the link to the specific library (ie: Japan One-Pager), then click "Actions" at the top of the list, then click "Alert Me." You may choose the settings of the alerts, however, recommended settings would be to select the following 3 buttons:

Change Type:	"New Items are added"
Send Alerts for These Changes:	"Anything Changes"
When to Send Alerts:	"Send email immediately"

This process needs to be repeated for each document library you wish to receive alerts for. Please let us know if you have any questions. Thank you.

経済産業省
Ministry of Economy, Trade and Industry

平成２３年４月８日
原子力安全・保安院

地震被害情報（第８０報）
（４月８日８時００分現在）

原子力安全・保安院が現時点で把握している東京電力(株)福島第一原子力発電所、福島第二原子力発電所、東北電力㈱女川原子力発電所、日本原子力発電（株）東海第二、電気、ガス、熱供給、コンビナート被害の状況は、以下のとおりです。

前回からの変更点は以下のとおり。

１．原子力発電所関係

○福島第一原子力発電所

・４号機について、コンクリートポンプ車（50t/h)が淡水約３８ｔ放水（4月7日18:23～19:40)。

２．産業保安関係

別紙参照

３．その他の被害

・4月7日午後、福島第一原子力発電所構内北側の土捨て場において、土のう作りをしていた作業員１名が体調不良になったため、Ｊビレッジに搬送し、身体サーベイにより汚染なしを確認した後、救急車にていわき市立共立病院に搬送された。

４．原子力安全・保安院の対応

原子力災害現地対策本部は、２０－３０ｋｍ圏内の地域住民等に向けた、ニュースレター第３号を公表（4月7日)。

PPPP/147

（別紙）

１　発電所の運転状況【自動停止号機数：１０基】

○東京電力(株)福島第一原子力発電所（福島県双葉郡大熊町及び双葉町）

（１）運転状況

１号機（46 万 kW）（自動停止）
２号機（78 万 4 千 kW）（自動停止）
３号機（78 万 4 千 kW）（自動停止）
４号機（78 万 4 千 kW）（定検により停止中）
５号機（78 万 4 千 kW）（定検により停止中、3 月 20 日 14:30 冷温停止）
６号機（110 万 kW）（定検により停止中、3 月 20 日 19:27 冷温停止）

（２）モニタリングの状況

別添参照

（３）主なプラントパラメーター（4 月 8 日 6:00 現在）

	１号機	２号機	３号機	４号機	５号機	６号機
原子炉圧力*1 [MPa]	0.491(A) 0.889(B)	0.090(A) 0.085(B)	0.099(A) 0.020(C)	－	0.103	0.104
原子炉格納容器圧力 (D/W) [kPa]	180	100	106.1	－	－	－
原子炉水位*2 [mm]	-1650(A) -1650(B)	-1500(A) 不明（B）	-2000(A) -2250(B)	－	1669	1691
原子炉格納容器内 S/C 水温 [℃]	－	－	－	－	－	－
原子炉格納容器内 S/C 圧力 [kPa]	150	D/S (調査中)	172.6	－	－	－
使用済燃料プール 水温度 [℃]	計器不良	63.0	計器不良	計器不良	34.8	28.0
備　考	4/8 0:00 現在の値	4/8 3:00 現在の値	4/8 1:30 現在の値	4/8 現在	4/8 6:00 現在の値	4/8 6:00 現在の値

＊１：絶対圧に換算
＊２：燃料頂部からの数値

（４）各プラントの状況

＜１号機関係＞

・原子力災害対策特別措置法第１５条（非常用炉心冷却装置注水不能）通報（3 月 11 日 16:36）

・ベント操作（3 月 12 日 10:17）
・１号機の原子炉圧力容器内に消火系ラインを用いて海水注入開始（3 月 12 日 20:20）→一時中断（3 月 14 日 1:10）
・１号機で爆発音。(3 月 12 日 15:36)
・消火系に加え、給水系を使うことにより炉心への注水量を増量（2m^3/h→18m^3/h）（3 月 23 日 2:33)。その後、給水系のみに切替（約 11m^3/h）（3 月 23 日 9:00)
・中央制御室の照明復帰（3 月 24 日 11:30)
・原子炉圧力容器へ淡水注入開始。(3 月 25 日 15:37)
・タービン建屋地下の溜まり水を測定した結果、主な核種として ^{131}I（ヨウ素）が 2.1×10^{5}Bq/cm^3、^{137}Cs（セシウム）が 1.8×10^{6}Bq/cm^3、検出された。
・消防ポンプによる淡水の原子炉圧力容器への注入を仮設電動ポンプに切り替え（3 月 29 日 8:32)
・タービン建屋地下の溜まり水を、3 月 24 日 17 時頃から復水器へ移送開始。復水器の水位が満水に近いことが確認されたため、復水器への排水を停止（3 月 29 日 7:30)。タービン建屋地下の溜まり水を復水器へ移送する準備のため、復水貯蔵タンクの水を、サプレッションプール水サージタンク（Ａ）へ移送開始（3 月 31 日 12:00）し、移送先をサプレッションプール水タンクへ（Ｂ）に切り替えた後（3 月 31 日 15：25)、移送を再開し、終了した（4 月 2 日 15:26)
・使用済燃料プールについて、コンクリートポンプ車が約 90t 放水（淡水）（3 月 31 日 13:03～16:04)。コンクリートポンプ車による放水位置の確認のため、試験放水（4 月 2 日 17:16～17:19)
・タービン建屋の一部の照明が点灯（4 月 2 日)
・原子炉圧力容器への淡水の注水に用いている電動ポンプの電源を仮設電源から外部電源に切り替えるため、一時的に消防ポンプに切り替えて原子炉へ淡水の注入を実施（4 月 3 日 10:42～11:52)
・原子炉圧力容器への淡水注入を外部電源に切り替え（4 月 3 日 12:02)
・タービン建屋地下の溜まり水を復水器へ移送する準備のため、復水器の水を復水貯蔵タンクへ移送開始（4 月 3 日 13:55)
・１号機の原子炉格納容器内での水素燃焼の可能性を下げることを目的として、原子炉格納容器への窒素封入操作開始（4 月 6 日 22:30)
・１号機の原子炉格納容器への窒素封入開始を確認（4 月 7 日 1:31)
・引き続き白煙の吐出確認（4 月 8 日 6:30 現在）
・原子炉圧力容器へ淡水注入中（4 月 8 日 8:00 現在）

＜２号機関係＞
・原子力災害対策特別措置法第１５条（非常用炉心冷却装置注水不能）通報（3 月 11 日 16:36)

・ベント操作（3 月 13 日 11:00）
・３号機の建屋の爆発に伴い、原子炉建屋ブローアウトパネル開放（3 月 14 日 11:00 過ぎ）
・原子炉圧力容器の水位が低下傾向（3 月 14 日 13:18）。原子力災害対策特別措置法第１５条事象（原子炉冷却機能喪失）である旨、受信（3 月 14 日 13:49）
・原子炉圧力容器内に消火系ラインを用いて海水注入作業開始(3 月 14 日 16:34)
・原子炉圧力容器の水位が低下傾向（3 月 14 日 22:50）
・ベント操作（3 月 15 日 0:02）
・２号機で爆発音するとともに、サプレッションプール（圧力抑制室）の圧力低下(3 月 15 日 6:10)。同室に異常が発生したおそれ(3 月 15 日 6:20 頃)
・外部送電線から予備電源変電設備までの受電を完了し、そこから負荷側へのケーブル敷設を実施（3 月 19 日 13:30）
・使用済燃料プールに海水を 40 t 注入（冷却系配管に消防車のポンプを接続）（3 月 20 日 15:05～17:20）
・２号機のパワーセンター受電（3 月 20 日 15:46）
・白煙が発生（3 月 21 日 18:22）
・白煙はほとんど見えない程度に減少（3 月 22 日 7:11 現在）
・使用済燃料プールに海水を 18 t 注入（3 月 22 日 16:07～17:01）
・使用済燃料プールに、使用済燃料プール冷却系を用いて海水を注入（3 月 25 日 10:30～12:19）
・原子炉圧力容器への淡水注入開始（3 月 26 日 10:10）
・中央制御室の照明復帰（3 月 26 日 16:46）
・消防ポンプによる淡水の原子炉圧力容器への注入を仮設電動ポンプに切り替え（3 月 27 日 18:31）
・２号機について、3 月 27 日に東京電力(株)が発表した福島第一原子力発電所２号機タービン建屋地下階溜まり水の測定結果について、^{134}I（ヨウ素）の測定値に誤りがあるとの判断を踏まえた再度の採取及び分析・評価の結果、^{134}I（ヨウ素）を含むガンマ核種の濃度については、検出限界値未満であることの報告（3 月 28 日 0:07）
・消防ポンプによる海水の使用済燃料プールへの注入を仮設電動ポンプによる淡水に切り替え注入（3 月 29 日 16:30～18:25）
・２号機において、30 日 9:25 より使用済燃料プールへの注入をしていたところ、仮設電動ポンプの不調が同日 9:45 に確認されたため、消防ポンプによる切り替えを行ったが、ホースの亀裂が確認(3 月 30 日 12:47、13:10)されたため、注入を中断。淡水注水を再開（3 月 30 日 19:05～23:50）
・使用済燃料プールに、使用済燃料冷却系を用いて仮設電動ポンプにより

淡水を約 70t 注入（4 月 1 日 14:56～17:05）

・タービン建屋地下の溜まり水を復水器へ移送する準備のため、復水貯蔵タンクの水をサプレッションプール水サージタンクへ移送（3 月 29 日 16:45～4 月 1 日 11:50）

・取水口付近にある電源ケーブルを収めているピット内に、1,000mSv/h を超える水が溜まっていること及びピット側面のコンクリート部分に長さ約 20cm の亀裂があり、当該部分より、水が海に流出していることを確認（4月2日9:30頃）。止水処置のため、コンクリートを注入（4月2日16:25、19:02）

・タービン建屋地下の溜まり水を復水器へ移送する準備のため、復水器の水を復水貯蔵タンクへ移送開始（4 月 2 日 17:10）

・トレンチ立坑及びタービン建屋地下１階の水位を監視するためのカメラを設置（4 月 2 日）

・タービン建屋の一部の照明が点灯（4 月 2 日）

・原子炉圧力容器への淡水の注水に用いている電動ポンプの電源を仮設電源から外部電源に切り替えるため、一時的に消防ポンプに切り替えて原子炉へ淡水の注入を実施（4 月 3 日 10:22～12:06）

・原子炉圧力容器への淡水注入を外部電源に切り替え（4 月 3 日 12:12）

・２号機バースクリーン近傍にあるピット内に溜まっている水の海水への流出を防止する措置として、取水電源トレンチの天端を破砕し、おがくず（3kg/袋）20 袋、高分子吸収材（100g/袋）80 袋、裁断処理した新聞紙（大きいゴミ袋）3 袋を投入（4 月 3 日 13:47～14:30）

・トレーサー（乳白色の入浴剤）約 13kg を海水配管トレンチ立坑から投入（4 月 4 日 7:08～7:11）

・使用済燃料プールに、使用済燃料冷却系を用いて仮設電動ポンプによる淡水（約 70ｔ）を注入（4 月 4 日 11:05～13:37）

・２号機バースクリーン近傍のピット周辺に２箇所の穴を開け、トレーサーを注入し、亀裂部から海に流出していることを確認（4 月 5 日 14:15）。ピット周辺に開けた穴に水流出防止のための凝固剤（水ガラス）注入開始（4 月 5 日 15:07）。水の流出が止まったことを確認（4 月 6 日 5:38 頃）。また、タービン建屋の水位については、上昇してないことを確認。さらに、流出していた箇所について、ゴム板と治具（つっかえ棒）により止水の対策を実施（4 月 6 日 13:15 完了）

・２号機の復水器の水を復水貯蔵タンクに移送するポンプを１台増設（計２台 30m^3/h）（4 月 5 日 15:40 頃）

・使用済燃料プール冷却系から使用済燃料プールに淡水注水（約 36t）（4 月 7 日 13:39～14:34）

・引き続き白煙の吐出確認（4 月 8 日 6:30 現在）

・原子炉圧力容器へ淡水注入中（4 月 8 日 8:00 現在）

＜３号機関係＞

・原子力災害対策特別措置法第１５条（非常用炉心冷却装置注水不能）通報（3 月 13 日 5:10）
・ベント操作（3 月 13 日 8:41）
・３号機の原子炉圧力容器内に消火系ラインから真水注入開始（3 月 13 日 11:55）
・３号機の原子炉圧力容器内に消火系ラインから海水注入開始(3 月 13 日 13:12)
・３号機及び１号機の注入をくみ上げ箇所の海水が少なくなったため停止(3 月 14 日 1:10)
・３号機の海水注入を再開(3 月 14 日 3:20)
・ベント操作（3 月 14 日 5:20）
・３号機の格納容器圧力が異常上昇(3 月 14 日 7:44)。原子力災害対策特別措置法第１５条事象である旨、受信（3 月 14 日 7:52）
・３号機で１号機と同様に原子炉建屋付近で爆発（3 月 14 日 11:01）
・３号機から白い湯気のような煙が発生（3 月 16 日 8:30 頃）
・３号機の格納容器が破損しているおそれがあるため、中央制御室（共用）から作業員退避（3 月 16 日 10:45)。その後、作業員は中央制御室に復帰し、注水作業再開（3 月 16 日 11:30）
・自衛隊ヘリにより３号機への海水の投下を４回実施(3 月 17 日 9:48、9:52、9:58、10:01)
・警察庁機動隊が放水のため現場到着（3 月 17 日 16:10）
・自衛隊消防車により放水（3 月 17 日 19:35）
・警察庁機動隊による放水（3 月 17 日 19:05～19:13）
・自衛隊消防車５台が放水（3 月 17 日 19:35、19:45、19:53、20:00、20:07）
・自衛隊消防車６台（6t 放水／台）が放水（3 月 18 日 14 時前～14:38）
・米軍消防車１台が放水（3 月 18 日 14:45 終了）
・東京消防庁ハイパーレスキュー隊が放水（3 月 20 日 3:40 終了）
・３号機の格納容器内圧力が上昇（3 月 20 日 11:00、320kPa)。圧力下げるための準備を進めていたが、直ちに放出を必要とする状況ではないと判断し、圧力監視を継続（3 月 21 日 12:15、120kPa）
・ケーブル引き込みの現地調査（3 月 20 日 11:00～16:00）
・東京消防庁ハイパーレスキュー隊が３号機の使用済燃料プールに放水（3 月 20 日 21:30～3 月 21 日 3:58）
・灰色がかった煙が発生（3 月 21 日 15:55 頃）
・煙が収まっていることを確認（3 月 21 日 17:55）
・灰色がかった煙は白みがかった煙に変化し終息に向かっていると思われる（3 月 22 日 7:11 現在）
・東京消防庁及び大阪市消防局が放水（約 180t）（3 月 22 日 15:10～16:00）

・中央制御室の照明復帰（3 月 22 日 22:43）
・使用済燃料プールに使用済燃料プール冷却系から海水 35t 注入（3 月 23 日 11:03～13:20）。海水約 120t 注入（3 月 24 日 5:35 頃～16:05 頃）
・原子炉建屋からやや黒色がかった煙が発生（3 月 23 日 16:20 頃）。3 月 23 日 23:30 頃及び 3 月 24 日 4:50 頃に確認したところ止んでいる模様。
・３号機タービン建屋１階及び地下１階において、ケーブル敷設作業を行っていた作業員が踏み入れた水について調査した結果、水表面の線量率は約 400mSv/h、採取水のガンマ線核種分析の結果、試料の濃度は各核種合計で約 3.9×10^{6}Bq/cm^3 であった。
・東京消防庁の支援を受けた川崎市消防局が放水（3 月 25 日 13:28～16:00）
・原子炉圧力容器へ淡水注入開始（3 月 25 日 18:02）
・コンクリートポンプ車（50t/h）が約 100t 放水（3 月 27 日 12:34～14:36）
・タービン建屋地下の溜まり水を復水器へ移送する準備のため、復水貯蔵タンクの水をサプレッションプール水サージタンクへ移送（3 月 28 日 17:40～3 月 31 日 8:40 頃）
・消防ポンプによる淡水の原子炉圧力容器への注入を仮設電動ポンプに切り替え（3 月 28 日 20:30）
・コンクリートポンプ車(50t/h)が淡水約 100t 放水(3 月 29 日 14:17～18:18)
・コンクリートポンプ車(50t/h)が淡水約 105t 放水(3 月 31 日 16:30～19:33)
・コンクリートポンプ車(50t/h)が淡水約 75t 放水（4 月 2 日 9:52～12:54）
・タービン建屋の一部の照明が点灯（4 月 2 日）
・トレンチ立坑の水位を監視するためのカメラを設置（4 月 2 日）
・原子炉圧力容器への淡水の注水に用いている電動ポンプの電源を仮設電源から外部電源に切り替えるため、一時的に消防ポンプに切り替えて原子炉へ淡水の注入を実施（4 月 3 日 10:03～12:16）
・原子炉圧力容器への淡水注入を外部電源に切り替え（4 月 3 日 12:18）
・コンクリートポンプ車(50t/h)が淡水約 70t 放水（4 月 4 日 17:03～19:19）
・コンクリートポンプ車（50t/h）が淡水（約 70t）放水（4 月 7 日 06:53～08:53）
・引き続き白煙の吐出確認（4 月 8 日 6:30 現在）
・原子炉圧力容器へ淡水注入中。（4 月 8 日 8:00 現在）

＜４号機関係＞
・原子炉圧力容器のシュラウド工事中のため、原子炉圧力容器内に燃料はなし。
・使用済燃料プール水温度が上昇（3 月 14 日 4:08 時点 84℃）
・４号機のオペレーションエリアの壁が一部破損していることを確認（3 月 15 日 6:14）
・４号機で火災発生。（3 月 15 日 9:38）事業者によると、自然に火が消え

ていることを確認（3月15日11:00頃）
・４号機で火災が発生（3月16日5:45頃）。事業者は現場での火災は確認できず（3月16日6:15頃）
・自衛隊が使用済燃料プールへ放水（3月20日9:43）
・ケーブル引き込みの現地調査（3月20日11:00～16:00）
・自衛隊が使用済燃料プールへ放水（3月20日18:30頃～19:46）
・自衛隊消防車13台が使用済燃料プールに放水（3月21日6:37～8:41）
・パワーセンターまでのケーブル敷設工事完了（3月21日15:00頃）
・パワーセンター受電（3月22日10:35）
・コンクリートポンプ車（50t/h）が約150ｔ放水（3月22日17:17～20:32）
・コンクリートポンプ車（50t/h）が約130ｔ放水（3月23日10:00～13:02）
・コンクリートポンプ車（50t/h）が約150ｔ放水（3月24日14:36～17:30）
・コンクリートポンプ車（50t/h）が約150ｔ放水（3月25日19:05～22:07）
・使用済燃料プールに、使用済燃料プール冷却系を用いて海水を注入（3月25日6:05～10:20）
・コンクリートポンプ車(50t/h)が約125t放水（3月27日16:55～19:25）
・中央制御室の照明復帰（3月29日11:50）
・コンクリートポンプ車(50t/h)が淡水約140t放水(3月30日14:04～18:33)
・コンクリートポンプ車(50t/h)が淡水約180t放水（4月1日8:28～14:14）
・タービン建屋の一部の照明が点灯（4月2日）
・4月2日より、集中環境施設プロセス主建屋の建屋内にたまった水を４号機のタービン建屋内に移送していたところ、4月3日より３号機のトレンチの立坑の水位が上昇したため、経路は不明であるものの念のため移送を中断（4月4日9:22）
・コンクリートポンプ車(50t/h)が淡水約180t放水(4月3日17:14～22:16)
・コンクリートポンプ車（50t/h)が淡水約20t放水（4月5日17:35～18:22）
・コンクリートポンプ車(50t/h)が淡水約３８ｔ放水(4月7日18:23～19:40)
・引き続き白煙の吐出確認（4月8日6:30現在）

＜５号機，６号機関係＞
・６号機の非常用ディーゼル発電機（D/G）１台目（Ｂ）は運転により電力供給。復水補給水系（MUWC）を用いて原子炉圧力容器及び使用済燃料プールへ注水。
・６号機の非常用ディーゼル発電機（D/G）２台目（Ａ）起動（3月19日4:22）
・５号機の残留熱除去系（RHR）ポンプ（Ｃ）（3月19日5:00）及び６号機の残留熱除去系（RHR）ポンプ（Ｂ）（3月19日22:14）が起動し、除熱機能回復。使用済燃料プールを優先的に冷却（電源：６号の非常用ディーゼル発電機）（3月19日5:00）

・５号機、冷温停止（3 月 20 日 14:30）
・６号機、冷温停止（3 月 20 日 19:27）
・５号機及び６号機、起動用変圧器まで受電（3 月 20 日 19:52）
・５号機、電源を非常用ディーゼル発電機から外部電源に切り替え（3 月 21 日 11:36）
・６号機、電源を非常用ディーゼル発電機から外部電源に切り替え（3 月 22 日 19:17）
・５号機の仮設の残留熱除去海水系（RHRS）ポンプが、仮設から本設の電源への切り替えの際、自動停止（3 月 23 日 17:24）
・５号機の仮設の残留熱除去海水系（RHRS）ポンプの修理が完了（3 月 24 日 16:14）し、冷却を再開（3 月 24 日 16:35）
・６号機の仮設の残留熱除去海水系（RHRS）ポンプが、仮設から本設の電源へ切り替え（3 月 25 日 15:38、15:42）
・５号機及び６号機サブドレンピットにある低レベルの地下水（約 1,500t）を放水口経由で海へ放出開始（4 月 4 日 21:00）

＜使用済燃料共用プール＞
・3 月 18 日 6:00 過ぎ、プールはほぼ満水であることを確認
・共用プールに注水（3 月 21 日 10:37～15:30）
・電源供給を開始（3 月 24 日 15:37）し、冷却を開始（3 月 24 日 18:05）
・4 月 7 日 7:45 時点でのプール水温度は 28℃程度

＜その他＞
・南放水口付近の海水核種分析の結果、^{131}I（ヨウ素）が 7.4×10^{1}Bq/cm^{3}（周辺監視区域外の水中濃度限度の 1850.5 倍）検出された（3 月 26 日 14:30）（3 月 29 日に計測した結果、水中濃度限度の 3,355.0 倍となった。（3 月 29 日 13:55）一方、１Ｆ放水口北側の海水核種分析の結果、^{131}I（ヨウ素）が 4.6×10^{1}Bq/cm^{3}（同 1,262.5 倍）検出された。（3 月 29 日 14:10））
・１～３号機タービン建屋外のトレンチ（配管を布設しているトンネル状の地下構造物）の立坑に水が溜まっていることを確認。水表面の線量は、１号機が 0.4mSv/h、２号機が 1,000mSv/h 以上、３号機はがれきがあり測定できず（3 月 27 日 15:30 頃）。１号機立坑内の溜留水を仮設ポンプにて集中環境施設プロセス主建屋の貯槽に移送し、立坑内の水位が上端から約-0.14m から約-1.14m に減少（3 月 31 日 9:20～11:25）
・福島第一原子力発電所の敷地内（５地点）の土壌から、3 月 21 日及び 3 月 22 日に採取した試料の中に、^{238}Pu（プルトニウム）、^{239}Pu（プルトニウム）、^{240}Pu（プルトニウム）を検出（3 月 28 日 23:45 東京電力発表）。検出されたプルトニウムの濃度は、過去の大気圏内核実験において国内で観測されたフォールアウト（放射性降下物）と同様、通常の環境レベルで人体に問題となるものではない。

・３号機建屋外において、残留熱除去海水系配管のフランジを取り外した際、協力企業作業員３名が、配管に溜まった水を被ったが、水を拭き取った結果、身体への放射性物質の付着はなかった（3 月 29 日 12:03）
・3 月 28 日、集中環境施設プロセス主建屋で水溜まりを確認し、放射能分析の結果、3 月 29 日管理区域内で総量約 1.2×10^{1}Bq/cm^3、非管理区域で総量 2.2×10^{1}Bq/cm^3 の放射能を検出した。
・南放水口付近の海水核種分析の結果、^{131}I（ヨウ素）が 1.8×10^{2}Bq/cm^3（周辺監視区域外の水中濃度限度の 4385.0 倍）検出された。(3 月 30 日 13:55)
・原子炉等の冷却に使用する淡水を積んだ米軍のはしけ船（１号船）１隻が海上自衛隊の艦船にえい航され、福島第一原子力発電所専用港に接岸（3 月 31 日 15:42)。はしけ船（１号船）からろ過水タンクへ淡水を移送開始（4 月 1 日 15:58)。その後、ホースの不具合により中断（4 月 1 日 16:25）したが、4 月 2 日に注水を再開（4 月 2 日 10:20～16:40）
・発電所敷地境界付近に設置している本設モニタリングポスト（№1～8）が復旧（3 月 31 日)。測定値については１日１回の予定。
・共用プールの山側の約 500m^2 の範囲に飛散防止剤の試験散布の吹きつけを実施（4 月 1 日 15:00～16:05）
・２隻目の原子炉等の冷却に使用する淡水を積んだ米軍のはしけ船（２号船）が海上自衛隊の艦船にえい航され、福島第一原子力発電所専用港に接岸（4 月 2 日 9:10）
・米軍のはしけ船（２号船）からはしけ船（１号船）へ淡水を移送（3 日 09:52～11:15）
・集中環境施設プロセス建屋内の低レベル滞留水については、放水口南側海域から１台目のポンプによる放出を開始（4 月 4 日 19:03）し、更に全 10 台のポンプによる放出を実施（4 月 4 日 19:07）
・福島第一原子力発電所の敷地内の土壌から、3 月 25 日（４地点）及び 3 月 28 日（３地点）に採取した試料（合計７検体）の中に、^{238}Pu（プルトニウム)、^{239}Pu（プルトニウム)、^{240}Pu（プルトニウム）を検出（4 月 6 日 18:30 東京電力発表)。検出されたプルトニウムの濃度は、前回（3 月 28 日公表）と同様に過去の大気圏内核実験において国内で観測されたフォールアウト（放射性降下物）と同程度であり、通常の環境レベルで人体に問題となるものではない
・専用港内からの汚染水の流出を防止するため、発電所南側防波堤周辺で大型土のうを用いた止水工事を実施（4 月 5 日 15:00～16:30）
・共用プール山側の約 600 m^2 の範囲に、地面の放射性物質の飛散を防ぐ飛散防止剤を試験的に散布（4 月 5 日、4 月 6 日）

○東京電力(株)福島第二原子力発電所（福島県双葉郡楢葉町及び富岡町）

（１）運転状況

１号機（110 万 kW）（自動停止、3 月 14 日 17:00 冷温停止）

２号機（110 万 kW）（自動停止、3 月 14 日 18:00 冷温停止）

３号機（110 万 kW）（自動停止、3 月 12 日 12:15 冷温停止）

４号機（110 万 kW）（自動停止、3 月 15 日 7:15 冷温停止）

（２）モニタリングポスト等の指示値

別添参照

（３）主なプラントパラメーター（4 月 8 日 6:00 現在）

	単位	１号機	２号機	３号機	４号機
原子炉圧力＊1	MPa	0.15	0.14	0.10	0.17
原子炉水温	℃	25.1	25.0	34.7	30.3
原子炉水位＊2	mm	9346	10346	7810	8785
原子炉格納容器内 ｻﾌﾟﾚｯｼｮﾝﾌﾟｰﾙ水温	℃	23	24	26	31
原子炉格納容器内 ｻﾌﾟﾚｯｼｮﾝﾌﾟｰﾙ圧力	kPa (abs)	105	106	111	110
備　考		冷温停止中	冷温停止中	冷温停止中	冷温停止中

＊１：絶対圧に換算

＊２：燃料頂部からの数値

（４）各プラントの状況

＜１号機関係＞

・3 月 30 日 17:56 頃、１号機において、タービン建屋の１階の電源盤から煙が上がっていたが、電気の供給を切ったところ、煙の発生が止まった。消防署により、19:15 当該事象は電源盤の異常であり、火災ではないと判断された。

・１号機の原子炉を冷却する残留熱除去系（Ｂ）の電源が、外部電源に加え非常用電源からも受電可能となり、全号機において、残留熱除去系（Ｂ）のバックアップ電源（非常用電源）を確保（3 月 30 日 14:30）

（５）その他異常等に関する報告

・１号機にて原子力災害対策特別措置法第１０条通報（3 月 11 日 18:08）

・１、２、４号機にて同法第１０条通報（3 月 11 日 18:33）

・１号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（3 月 12 日 5:22）

・２号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（3 月 12 日 5:32）

・４号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生（3 月 12 日 6:07）

○東北電力(株)女川原子力発電所（宮城県牡鹿郡女川町、石巻市）

（１）運転状況

１号機（52万4千kW）（自動停止、3月12日0:58冷温停止）

２号機（82万5千kW）（自動停止、地震時点で冷温停止）

３号機（82万5千kW）（自動停止、3月12日1:17冷温停止）

（２）モニタリングポスト等の指示値

MP２付近（敷地最北敷地境界）：

約0.37μSv/h（4月7日16:00）（約0.38μSv/h（4月6日16:00））

（３）その他異常に関する報告

・タービン建屋地下１階の発煙は消火確認（3月11日22:55）

・原子力災害対策特別措置法第１０条通報（3月13日13:09）

２　産業保安

○電気（4月8日8:00現在）

・東北電力（4月8日6:00現在）

停電戸数：約392万戸　（昨日（４月７日）午後１１時３２分頃発生した宮城県沖を震源とする地震による停電戸数を含む。）

停電地域：青森県　全域で停電（約91万戸）

岩手県　全域で停電（約81万戸）

秋田県　全域で停電（約67万戸）

宮城県　一部地域で停電（約92万戸）

山形県　一部地域で停電（約58万戸）

福島県　一部地域で停電（約4万戸）

・東京電力

停電は3月19日01:00までに復旧済（延べ停電戸数　約405万戸）

・北海道電力

停電は3月12日14:00までに復旧済　（延べ停電戸数　約３千戸）

・中部電力

停電は3月12日17:11に復旧済　（延べ停電戸数　約４百戸）

［参考情報］現在停止中の発電所（原子力発電所を除く）

・東京電力（4月7日16:00現在）※地震により停止中の発電所

広野火力発電所　２，４号機

常陸那珂火力発電所　１号機

鹿島火力発電所　２，３，５，６号機

・東北電力（4月8日6:00現在）※昨日（４月７日）午後１１時３２分頃発生した宮城県沖を震源とする地震による停電戸数を含む。

八戸火力発電所　３号機
能代火力発電所　１，２号機
秋田火力発電所　２，３，４号機
仙台火力発電所　４号機
新仙台火力発電所　１，２号機
原町火力発電所　１，２号機

○都市ガス（4月7日20:30現在）
・供給停止戸数※約21万戸（延べ供給停止戸数　約50万戸）
※供給停止戸数には、家屋倒壊等が確認された戸数を含む。
（１）一般ガス（4月7日20:30現在）
死亡事故：地震との関係も含め原因詳細調査中。
・盛岡ガス（盛岡市）死者1名、負傷者10名
3月14日08:00　デパートの地下での爆発
・東部ガス（いわき市）死者1名
3月12日11:30　一般住宅での漏えいガスに着火

北海道、山形県、秋田県においては、供給停止の報告はない。
各社の供給停止状況は以下の通り。（家屋倒壊等が確認された戸数は含まない。）
・仙台市営ガス　132,185戸供給停止
（昨日（４月７日）午後１１時３２分頃発生した宮城県沖を震源とする地震により、一部地域で供給停止（５，６４３戸）。）
・塩釜ガス（塩釜市）2,713戸供給停止
・釜石ガス（釜石市）2,448戸供給停止
・常磐共同ガス（いわき市）4,044戸供給停止
・常磐都市ガス（いわき市）178戸供給停止
・気仙沼市営ガス（気仙沼市）436戸供給停止
・石巻ガス（石巻市）8,542戸供給停止
（２）簡易ガス（4月7日20:30現在）
各社の供給停止状況は以下の通り。（家屋倒壊等が確認された戸数は含まない。）
・釜石瓦斯（釜石市）450戸供給停止
（上閉伊郡大槌町）390戸供給停止
・カメイ（東松島市）66戸供給停止
・いわきガス（いわき市）112戸供給停止
・三重商会（大船渡市）12戸供給停止
・名取岩沼農業協同組合（岩沼市）163戸供給停止
・ガス＆ライフ（東松島市）341戸供給停止

・鳴瀬ガス（東松島市）87戸供給停止
・仙台市営ガス　昨日（４月７日）午後１１時３２分頃発生した宮城県沖を震源とする地震により、一部地域で供給停止（４３０戸）。

○熱供給（4月7日20:30現在）
・小名浜配湯（いわき市小名浜）供給停止

○ＬＰガス（3月27日15:30現在）
死亡事故：地震との関係も含め原因詳細調査中
・福島県いわき市　死者１名
3月13日午前中　共同住宅でガス爆発

○コンビナート（3月27日15:30現在）
・コスモ石油千葉製油所（千葉県市原市）
ＬＰＧ貯槽の支柱が折れ、破損。ガス漏れ火災。
重傷者１名、軽傷５名。3月21日午前鎮火。
・JX日鉱日石エネルギー(株)仙台製油所（宮城県仙台市）
出荷設備エリアで爆発、火災が発生。3月15日午後鎮火。

３　原子力安全・保安院等の対応

【3月11日】

１４：４６　地震発生と同時に原子力安全・保安院に災害対策本部設置

１５：４２　福島第一原子力発電所にて原子力災害対策特別措置法第１０条通報

１６：３６　福島第一原子力発電所１、２号機にて事業者が同法第１５条事象（非常用炉心冷却装置注水不能）発生判断（16:45通報）

１８：０８　福島第二原子力発電所１号機にて原子力災害対策特別措置法第１０条通報

１８：３３　福島第二原子力発電所１、２、４号機にて原子力災害対策特別措置法第１０条通報

１９：０３　緊急事態宣言（政府原子力災害対策本部及び同現地対策本部設置）

２０：５０　福島県対策本部は、福島第一原子力発電所１号機の半径２ｋｍの住人に避難指示を出した。（２ｋｍ以内の住人は1,864人）

２１：２３　内閣総理大臣より、福島県知事、大熊町長及び双葉町長に対し、東京電力(株)福島第一原子力発電所で発生した事故に関し、原子力災害対策特別措置法第１５条第３項の規定に基づく指示を出した。
・福島第一原子力発電所から半径３ｋｍ圏内の住民に対する避難指示。

・福島第一原子力発電所から半径１０ｋｍ圏内の住民に対する屋内退避指示。

２４：００　池田経済産業副大臣現地対策本部到着

【3 月 12 日】

０：４９　福島第一原子力発電所１号機にて事業者が同法第１５条事象（格納容器圧力異常上昇）発生判断（01:20 通報）

５：２２　福島第二原子力発電所１号機にて事業者が原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生判断（6:27 通報）

５：３２　福島第二原子力発電所２号機にて事業者が原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生判断（6:27 通報）

５：４４　総理指示により福島第一原子力発電所の１０ｋｍ圏内に避難指示

６：０７　福島第二原子力発電所４号機にて原子力災害対策特別措置法第１５条事象（圧力抑制機能喪失）発生

６：５０　原子炉等規制法第６４条第３項の規定に基づき、福島第一原子力発電所第１号機及び第２号機に設置された原子炉格納容器内の圧力を抑制することを命じた。

７：４５　内閣総理大臣より、福島県知事、広野町長、楢葉町長、富岡町長及び大熊町長に対し、東京電力(株)福島第二原子力発電所で発生した事故に関し、原子力災害対策特別措置法第１５条第３項の規定に基づく指示を出した。

・福島第二原子力発電所から半径３ｋｍ圏内の住民に対する避難指示。

・福島第二原子力発電所から半径１０ｋｍ圏内の住民に対する屋内退避指示。

１７：００　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

１７：３９　内閣総理大臣が福島第二原子力発電所の避難区域

・福島第二原子力発電所から半径１０ｋｍ圏内の住民に対する避難を指示。

１８：２５　内閣総理大臣が福島第一原子力発電所の避難区域

・福島第一原子力発電所から半径２０ｋｍ圏内の住民に対する避難を指示。

１９：５５　福島第一原子力発電所１号機の海水注入について総理指示

２０：０５　総理指示を踏まえ、原子炉等規制法第６４条第３項の規定に基づき、福島第一原子力発電所第１号機の海水注入等を命じた。

２０：２０　福島第一原子力発電所１号機の海水注入を開始

【3 月 13 日】

５：３８　福島第一原子力発電所３号機にて原子力災害対策特別措置法第１５条事象（全注水機能喪失）である旨、受信。

当該サイトについて、東京電力において現在、電源及び注水機能の回復と、ベントのための作業を実施中。

９：０１　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

９：０８　福島第一原子力発電所３号機の圧力抑制及び真水注入を開始

９：２０　福島第一原子力発電所３号機の耐圧ベント弁開放

９：３０　福島県知事、大熊町長、双葉町長、富岡町長、浪江町長に対し、原子力災害対策特別措置法に基づき、放射能除染スクリーニングの内容について指示

１３：０９　女川原子力発電所にて原子力災害対策特別措置法第１０条通報

１３：１２　福島第一原子力発電所３号機の注入を真水から海水に切り替え

１４：３６　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3 月 14 日】

１：１０　福島第一原子力発電所１号機及び３号機の注入をくみ上げ箇所の海水が少なくなったため停止。

３：２０　福島第一原子力発電所３号機の海水注入を再開

４：４０　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

５：３８　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

７：５２　福島第一原子力発電所３号機にて原子力災害対策特別措置法第１５条事象（格納容器圧力異常上昇）である旨、受信

１３：２５　福島第一原子力発電所２号機にて原子力災害対策特別措置法第１５条事象（原子炉冷却機能喪失）である旨、受信

２２：１３　福島第二原子力発電所にて原子力災害対策特別措置法第１０条通報

２２：３５　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3 月 15 日】

０：００　国際原子力機関（IAEA）専門家派遣の受け入れを決定

IAEA 天野事務局長による原子力発電所の被害に関する専門家派遣の意向を受け、原子力安全・保安院は IAEA による知見ある専門家の派遣を受け入れることとした。なお、実際の受け入れ日程等については、今後調整を行う

０：００　米国原子力規制委員会（NRC）専門家派遣の受け入れを決定

７：２１　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

７：２４　（独）日本原子力研究開発機構東海研究開発センター核燃料サイ

クル工学研究所にて原子力災害対策特別措置法第１０条通報

７：４４　（独）日本原子力研究開発機構原子力科学研究所にて原子力災害対策特別措置法第１０条通報

８：５４　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

１０：３０　経済産業大臣が原子炉等規制法に基づき、４号機の消火及び再臨界の防止、２号機の原子炉内への早期注水及びドライウェルのベントの実施について指示

１０：５９　今後の事態の長期化を考慮し、現地対策本部の機能を福島県庁内へ移転することを決定。

１１：００　内閣総理大臣が福島第一原子力発電所の避難区域
・炉内の状況を考慮して、新たに福島第一原子力発電所から半径２０ｋｍ圏～３０ｋｍ圏内の住民に対する屋内退避を指示

１６：３０　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

２２：００　経済産業大臣が原子炉等規制法に基づき、４号機の使用済燃料プールへの注水の実施を指示

２３：４６　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3 月 18 日】

１３：００　文部科学省にて、福島第一、第二原子力発電所の緊急時における全国的モニタリング調査の強化を決定

１５：５５　原子炉等規制法第６２条の３に基づき、東京電力(株)福島第一原子力発電所第１・２・３・４号機における事故故障等（原子炉建屋内の放射性物質の非管理区域への漏えい）の報告を受理

１６：４８　原子炉等規制法第６２条の３に基づき、日本原子力発電(株)東海第二発電所における事故故障等(非常用ディーゼル発電機２Ｃ海水ポンプ用電動機の故障）の報告を受理

【3 月 19 日】

７：４４　６号機の非常用ディーゼル発電機２台目（Ａ）起動
５号機の残留熱除去系（RHR）ポンプ（Ｃ）が起動し、使用済燃料プールの冷却を開始（電源：６号機の非常用ディーゼル発電機））の旨を受信

８：５８　福島第一原子力発電所にて原子力災害対策特別措置法第１５条事象（敷地境界放射線量異常上昇）である旨、受信

【3 月 20 日】

２３：３０　原子力災害対策現地本部から、放射能除染スクリーニングレベルの基準を以下のとおり変更する旨、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、

葛尾村、広野町、いわき市、飯舘村）宛に指示

【3月21日】

７：４５　原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出

１６：４５　原子力災害対策現地本部長から「屋内退避圏内での暖房器具の使用に係る換気について」として、一酸化炭素中毒等の防止の観点及び被ばく低減の観点から、屋内において換気を必要とする暖房器具を使用する場合の対応について屋内退避圏内の住民に周知する旨の指示を福島県知事及び市町村長（いわき市、田村市、南相馬市、広野町、川内村、浪江町、葛尾村、飯舘村）宛に発出。

１７：５０　原子力災害対策本部長から、ホウレンソウ及びカキナ、原乳について当分の間、出荷を控えるよう、関係事業者等に要請することの指示を福島県、茨城県、栃木県及び群馬県の各知事宛に発出。

【3月22日】

１６：００　原子力安全委員会緊急技術助言組織から、3月22日付け東京電力の「海水分析結果について」に関する原子力安全・保安院からの助言依頼について、回答（助言）を受理。

【3月25日】

原子力安全・保安院は、東京電力株式会社に対し、3月24日に発生した福島第一原子力発電所３号機タービン建屋における作業員の被ばくに関し、再発防止の観点から、直ちに放射線管理を見直し、改善するよう、口頭で指示。

【3月28日】

原子力安全・保安院は、東京電力株式会社に対し、3月27日に東京電力(株)が発表した福島第一原子力発電所２号機タービン建屋地下階溜まり水の測定に係る評価の誤りについて、再発防止を図るよう、口頭で指示。

１３：５０　原子力安全・保安院は、原子力安全委員会臨時会議助言（福島第一発電所２号機タービン建屋地下１階の滞留水について）を受け、東京電力株式会社に対し、海水モニタリングポイントの追加や地下水モニタリングの実施について、口頭で指示。

原子力安全・保安院は、東京電力(株)に対し、タービン建屋の屋外で確認された水に係る報告が遅れたことに対し、重要な情報については、社内の情報伝達をスムーズにするとともに、適時適切に報告が行われるように指導。

【3月29日】

１１：１６　原子炉等規制法第６２条の３及び電気関係報告規則第３条に基づき、東北電力(株)女川原子力発電所における事故故障等（津波による２号機原子炉補機冷却水ポンプ(B)等の故障及び１号機補助ボイラー重油タンクの倒壊）についての報告を受理。

原子力災害被災者支援の体制強化のため、経済産業大臣をチーム長とする「原子力被災者生活支援チーム」の設置、関係市町村への訪問等を実施。

原子力災害現地対策本部は、２０－３０ｋｍ圏内の地域住民等に向けた、ニュースレター第１号を公表。

【3月30日】

各電気事業者等に対し、平成23年福島第一・第二原子力発電所事故を踏まえた他の発電所の緊急安全対策の実施に係る指示文書を発出し、手交。

【3月31日】

原子力安全・保安院は、東京電力(株)に対し、3月31日の福島第二原子力発電所への街宣車の進入について、核物質防護等に係る対策に万全を期すよう口頭で指示。

原子力安全・保安院は、東京電力(株)に対し、作業員の放射線管理に万全を期すように注意喚起。

原子力災害現地対策本部は、２０－３０ｋｍ圏内の地域住民等に向けた、ニュースレター第２号を公表。

【4月 1日】

原子力安全・保安院は、東京電力(株)に対し、核種分析結果の誤りについて以下の３点について適切な対応をとるように厳重注意。

・核種分析の過去の評価結果について、どの核種について評価の誤りがあるかを明らかにし、すみやかに再評価を行うこと。
・評価の誤りが発生した原因を調査するとともに、再発防止の徹底を行うこと。
・評価結果の誤り等については判明した段階で、早急に連絡を行うこと。

【4月 2日】

福島第一原子力発電所２号機取水口付近からの放射性物質を含む液体の海への流出について、サンプリングした液体の核種分析を実施すること、２号機周辺に今回漏えいが発見され施設と同様の箇所がないか確認すること及び当該施設周辺においてより多くの場所で水を採取しモニタリングを強化することを口頭により指示。

【4月 4日】

緊急やむ得ない措置として、海洋放出を実施するに当たっての助言を原子力安全委員会に求め、東京電力(株)に対し、現在実施している海洋モニタリングを着実に実施するとともに、さらに強化（測定ポイントの増加、実施頻度の増大）することにより、海洋放出による放射性物質の拡散による影響を調査・確認し、情報公開に努めること、併せて、海洋への放出を可能な限り低減するための方策を強化することを指示。

【4月 5日】

福島第一原子力発電所から環境に影響を与える可能性のある放射性物質の放出に伴う措置に係る地方公共団体への事前の通報連絡について、指示文書を発出。

【4月6日】

１号機原子炉格納容器への窒素封入を実施するに当たって、原子力安全・保安院から東京電力に対して以下の３点について指示（4月6日 12:40)。①プラントパラメーターを適切に管理し、その変化に応じて安全を確保するための措置が適切に講じられるようにすること。②当該作業に従事する作業員の安全を確保する体制等を確立し実施すること。③窒素封入により当該原子炉格納容器内の気体が外部に漏出する可能性が否定できないことから、モニタリングを確実に実施し、更に強化することにより、窒素封入に伴う放射性物質の放出及び拡散による影響を調査及び確認し、情報公開に努めること。

【4月7日】

原子力災害現地対策本部は、２０－３０ｋｍ圏内の地域住民等に向けた、ニュースレター第３号を公表（4月7日）

＜被ばくの可能性（4月8日 8:00現在）＞

１．住民の被ばく

（１）二本松市福島県男女共生センターにおいて、双葉厚生病院からの避難者約60名を含む133名の測定を行い、13,000cpm以上の23名に除染を実施した。

（２）この他、福島県が用意した民間バスで、双葉厚生病院から川俣町済生会川俣病院へ移動した35名については、県対策本部は被ばくしていないと判断。

（３）バスにより避難した双葉町の住民約100名について、100名のうち、9名について測定した結果、以下の通りだった。県外(宮城県)に分かれて避難したが、その後合流して二本松市福島男女共生センターへ移動。

カウント数	人数
18,000cpm	１名
30,000～36,000cpm	１名
40,000cpm	１名
40,000cpm 弱※	１名
ごく小さい値	５名

※（１回目の測定では 100,000cpm を超え、その後靴を脱いで測定した結果計測されたもの）

（４）3 月 12 日から 3 月 15 日にかけて、大熊町のオフサイトセンターにおいて、スクリーニングを開始。現在までに 162 名が検査済み。初め除染の基準値を 6,000cpm とし、110 名が 6,000cpm 未満、41 名が 6,000cpm 以上の値を示した。後に基準値を 13,000cpm と引き上げた際には、８名が 13,000cpm 未満、３名が 13,000cpm 以上の値を示した。

検査を受けた 162 名のうち、５名が除染処置を施した後、病院へ搬送された。

（５）福島県において、避難した１０ｋｍ圏内の入院患者と病院関係者の避難を実施。関係者のスクリーニングを行った結果、3 名について除染後も高い数値が検出されたため、第２次被ばく医療機関へ搬送。この搬送に関係した消防職員 60 名のスクリーニングで 3 名について、バックグランドの２倍以上程度の放射線が検出されたため、60 名に対し除染を行った。

（６）福島県は 3 月 13 日からスクリーニングを開始。避難所を巡回、保健所等 13 ヶ所（常設）で実施中。4 月 6 日までに 133,972 人に対し実施。そのうち、100,000cpm 以上の値を示した者は 102 人であったが、100,000cpm 以上の数値を示した者についても脱衣等をし、再計測したところ、100,000cpm 以下に減少し、健康に影響を及ぼす事例はみられなかった。

２．従業員等の被ばく

福島第一原子力発電所で作業していた従業員で 100mSv を超過した作業員は、計 21 名。

なお、当該作業員３名のうち、２名については、両足の皮膚に放射性物質の付着を確認し、ベータ線熱傷の可能性があると判断されたことから、3 月 24 日に福島県立医科大学附属病院へ搬送し、その後、3 月 25 日に作業員３名とも千葉県にある放射線医学総合研究所に到着。検査の結果、２人の足の被ばく量は２～３Sv と推定され、足及び内部被ばく共に治療が必要となるレベルではなかったが、３名とも、入院して経過を見ることとなった。3 月 28 日正午頃３名の方がすべて退院した。

また、4 月 1 日 11:35 頃、米軍のはしけ船のホース手直し作業のために岸から船に乗り込む際、作業員１名が海に落下した。すぐに周囲の作業員に救助され、けが及び外部汚染はなかったが、念のため、ホールボディカウンタに

よる内部取り込みの確認を行う予定。

３．その他

（１）福島第一原発で作業していた自衛隊員４名が爆発により負傷。うち、１名は放医研に搬送され、検査の結果、外傷のみで、被ばくによる健康被害はないと判断され、3 月 17 日に退院。防衛省において、その他自衛官の被ばくは確認されず。

（２）警察官について、警察庁において２名の除染の実施を確認。異常の報告はなし。

（３）3 月 24 日、川俣町保健センター等において、１～15 歳までの 66 名の小児に対する甲状腺の検査を実施。問題となるレベルではなかった。

（４）3 月 26 日～3 月 27 日、いわき市保健所において、0～15 歳までの 137 名の小児に対する甲状腺の検査を実施。問題となるレベルではなかった。

（５）3 月 28 日～3 月 30 日、川俣町公民館及び飯舘村役場において、0～15 歳までの 946 名の小児に対する甲状腺の検査を実施。問題となるレベルではなかった。

＜放射能除染スクリーニングレベルに関する指示＞

（１）3 月 20 日、原子力災害対策現地本部から、放射能除染スクリーニングレベルの基準を以下のとおり変更する旨、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に指示。

旧：γ線サーベイメーターにより 40 ベクレル/c ㎡または 6,000cpm

新：1 マイクロシーベルト／時（10cm 離れた場所での線量率）またはこれに相当する 100,000cpm

＜避難時における安定ヨウ素剤投与の指示＞

（１）3 月 16 日、原子力災害対策現地本部から、「避難区域（半径２０ｋｍ）からの避難時における安定ヨウ素剤投与の指示」を県知事及び市町村（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出。

（２）3 月 21 日、原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村）宛に発出。

＜負傷者の状況（4月8日8:00現在）＞

1．3月11日の地震による福島第一原子力発電所の負傷者

・社員２名（軽傷、既に仕事復帰）

・協力会社２名（うち１名両足骨折で入院中）

・死亡２名（地震発生後から東京電力（株）の社員２名が行方不明となり、操作を継続してきたが、3月30日午後、４号機タービン建屋地下一階において当該社員２名が発見され、4月2日までに死亡が確認された。）

2．3月12日の福島第一原子力発電所１号機の爆発による負傷者

・１号機付近で爆発と発煙が発生した際に４名（社員２名、協力会社２名）が１号タービン建屋付近（管理区域外）で負傷。川内診療所で診療。社員２名は既に仕事復帰。協力会社の２名は自宅療養中。

3．3月14日の福島第一原子力発電所３号機の爆発による負傷者

・社員４名（既に仕事復帰）

・協力会社３名（既に仕事復帰）

・自衛隊４名（うち１名は内部被ばくの可能性を考慮し、「（独）放射線医学総合研究所」へ搬送。診察の結果内部被ばくはなし。3月17日退院）

4．その他の被害

・3月11日の地震発生の際に、福島第二原子力発電所において、協力会社の１名（クレーンオペレータ）が死亡。（タワークレーンが折れ、オペレータルームがつぶれ、頭に当たった模様。）

・3月12日に急病人１名発生（脳梗塞、救急車搬送、入院中）

・3月12日に管理区域外にて社員１名が左胸の痛みを訴えて救急車を要請（意識あり、現在、自宅療養中。）

・3月13日に社員２名が中央制御室での全面マスク着用中に不調を訴え、福島第二の産業医の受診を受けるべく搬送（１名は既に仕事復帰、残り１名は自宅療養中）

・3月22日、23日に共用プールで仮設電源盤の作業中に協力会社の２名が負傷し、産業医のいる福島第二原子力発電所へ搬送。（１名は既に仕事復帰、残り１名は自宅療養中）

・4月7日午後、福島第一原子力発電所構内北側の土捨て場において、土のう作りをしていた作業員１名が体調不良になったため、Ｊビレッジに搬送し、身体サーベイにより汚染なしを確認した後、救急車にていわき市立共立病院に搬送された。

＜住民避難の状況（4月8日8:00現在）＞

3月15日11:00、内閣総理大臣の指示により、福島第一原子力発電所半径２０ｋｍから３０ｋｍ圏内の住民に対して、屋内退避を指示。その旨を福島県及

び関係自治体へ連絡。

福島第一原子力発電所２０ｋｍ圏外及び福島第二原子力発電所１０ｋｍ圏外への避難は、措置済。

・福島第一原子力発電所２０ｋｍから３０ｋｍ圏内の屋内退避について、徹底中。

・福島県と連携して、屋内退避圏内の住民の生活支援等を実施。

・3 月 28 日、官房長官から福島第一原子力発電所から半径２０ｋｍ圏内の立ち入り規制の継続について発言。同日、原子力災害現地対策本部から関係市町村に対して、２０ｋｍ圏内の避難地域への立入禁止について通知。

＜飲食物への指示＞

原子力災害対策本部長より、福島県、茨城県、栃木県、群馬県、千葉県の知事に対して、以下の品目について、当分の間、出荷等を控えるよう指示。

また、原子力災害対策本部は、出荷制限等の発動・解除の考え方については、原子力安全委員会の助言も踏まえ、以下のように整理した。

・出荷制限・解除の対象区域は、汚染区域の拡がりや集荷実態等を踏まえ、市町村単位など県を分割した区域ごとに行うことも可能とする

・暫定規制値を超えた品目の出荷制限については、汚染の地域的拡がりを勘案しつつ総合的に判断

・出荷制限の解除は、福島第一原子力発電所の状況を勘案しつつ、約１週間ごと検査を行い、３回連続で暫定規制値を下回った品目・区域に対して実施

・だたし、原子力発電所から放射性物質の放出が継続している間は、解除後も引き続き約１週間ごとに検査を実施

（１）出荷制限・摂取制限品目（4 月 8 日現在）

都道府県	出荷制限品目	摂取制限品目
福島県	非結球性葉菜類、結球性葉菜類、アブラナ科の花蕾類（ホウレンソウ、キャベツ、ブロッコリー、カリフラワー、小松菜、茎立菜、信夫冬菜、アブラナ、ちぢれ菜、山東菜、紅菜苔、カキナなど）、カブ、原乳	非結球性葉菜類、結球性葉菜類及びアブラナ科の花蕾類（ホウレンソウ、キャベツ、ブロッコリー、カリフラワー、小松菜、茎立菜、信夫冬菜、アブラナ、アブラナ、ちぢれ菜、山東菜、紅菜苔、カキナなど）
茨城県	ホウレンソウ、カキナ、パセリ、原乳	
栃木県	ホウレンソウ、カキナ	
群馬県	ホウレンソウ、カキナ	
千葉県	・香取市及び多古町において産出されたホウレンソウ ・旭市において採取されたホウレンソウ、チンゲンサイ、シュンギク、サンチュ、セルリー及びパセリ	

（２）水道水の飲用制限の要請（4 月 8 日 8:00 現在）

制限範囲	水道事業（対象自治体）
利用するすべての住民	なし
乳児 ・対応を継続している水道事業	飯舘村飯舘簡易水道事業（福島県飯舘村）
・対応を継続している水道用水供給事業	なし

＜屋内退避圏内での暖房器具の使用に係る換気についての指示＞

3 月 21 日、原子力災害対策現地本部長から「屋内退避圏内での暖房器具の使用に係る換気について」として、一酸化炭素中毒等の防止の観点及び被ばく低減の観点から、屋内において換気を必要とする暖房器具を使用する場合の対応について屋内退避圏内の住民に周知する旨の指示を福島県知事及び市町村長（いわき市、田村市、南相馬市、広野町、川内村、浪江町、葛尾村、飯館村）宛に発出。

＜消防機関の活動状況＞

・3 月 22 日 11:00～14:00 頃：新潟市消防局及び浜松市消防局が大型除染システムの東京電力による設営を指導。
・3 月 23 日 8:30～9:30、13:30～14:30：新潟市消防局及び浜松市消防局が大型除染システムの東京電力による運用を指導。

（本発表資料のお問い合わせ）
原子力安全・保安院
原子力安全広報課：吉澤、杉山
電話：０３－３５０１－１５０５
０３－３５０１－５８９０

From: Hoc, PMT12
Sent: Sunday, April 17, 2011 6:13 AM
To: OST01 HOC
Subject: FW: DRAFT FOR UPDATING - Japan One Pager 0700 EDT 4-17-11
Attachments: DRAFT Japan One Pager 0700 EDT 4-17-11.docx

From: OST01 HOC
Sent: Sunday, April 17, 2011 12:04 AM
To: Hoc, PMT12; RST01 Hoc; LIA08 Hoc; Tracy, Glenn
Subject: DRAFT FOR UPDATING - Japan One Pager 0700 EDT 4-17-11

Please update throughout the night/morning and e-mail final edits to OST01 by 6:00 am.

Thank you

PPPD/148

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

PPPP/149

(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. Furthermore, the measures to stop water by means of rubber board and jig (prop) were implemented at the outflowing point. (Finished at 13: 15 April 6th)
- One more pump for the transfer of the water in the Condenser of Unit 2 to the Condensate Storage Tank was installed. (Two pumps in total: 30 m^3/h) (Around 15:40 April 5th)
- 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 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 ・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.

(Contact Person)
Mr. Toshihiro Bannai
Director, International Affairs Office, NISA/METI
Phone:+81-(0)3-3501-1087

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^{1}Sv/h (As of 13:00, April 8th)	D/W: 2.94×10^{1}Sv/h S/C: 7.65×10^{-1}Sv/h (As of 12:00,April 8th)	D/W: 1.88×10^{1}Sv/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)

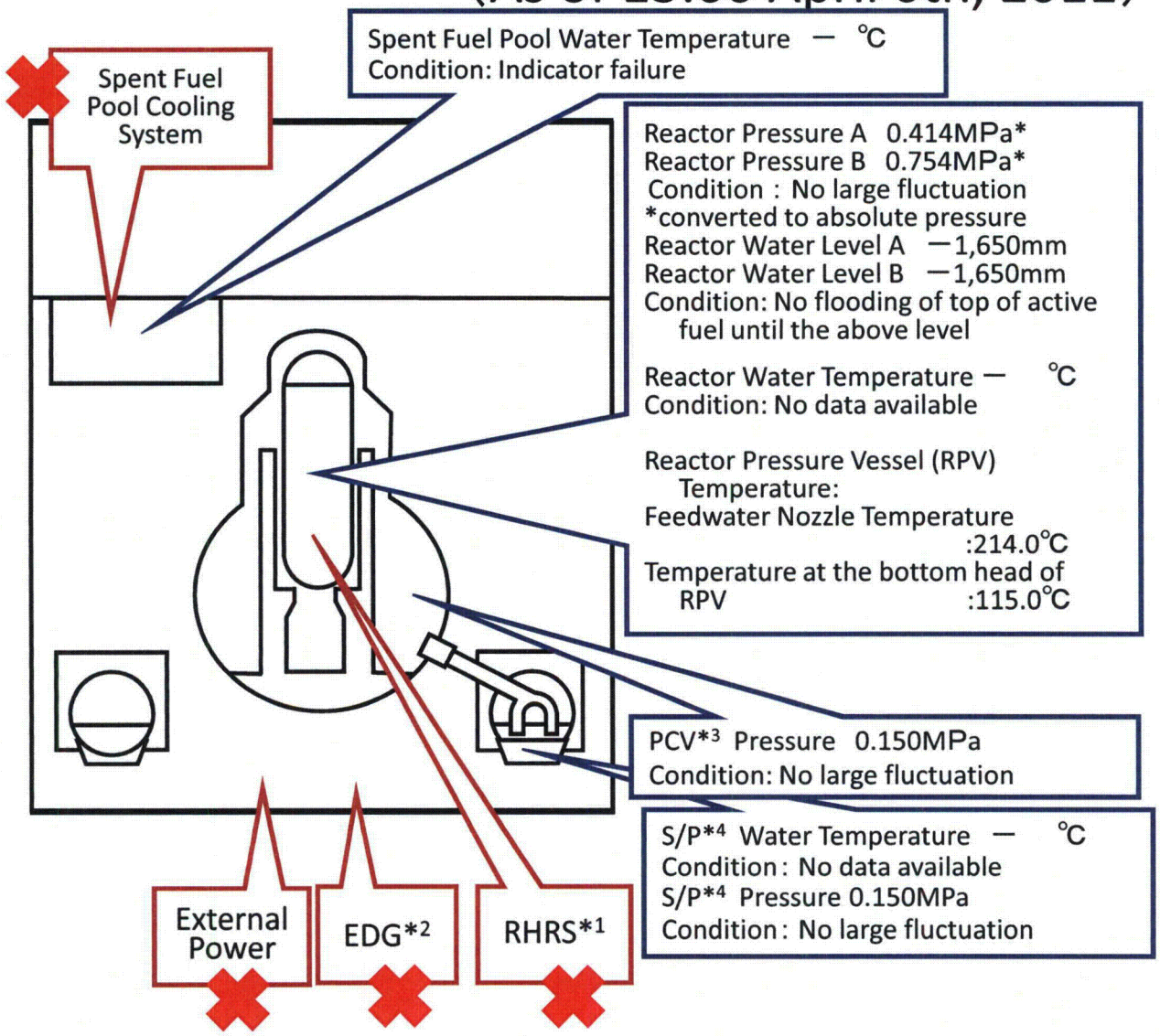
Pressure conversion	Gauge pressure (MPa g) = Absolute pressure (MPa abs) – Atmospheric pressure (Normal atmospheric pressure 0.1013MPa) Absolute pressure (MPa abs) = Gauge pressure (MPa g) + Atmospheric pressure (Normal atmospheric pressure 0.1013MPa)

*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)



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

Major Events after the earthquake

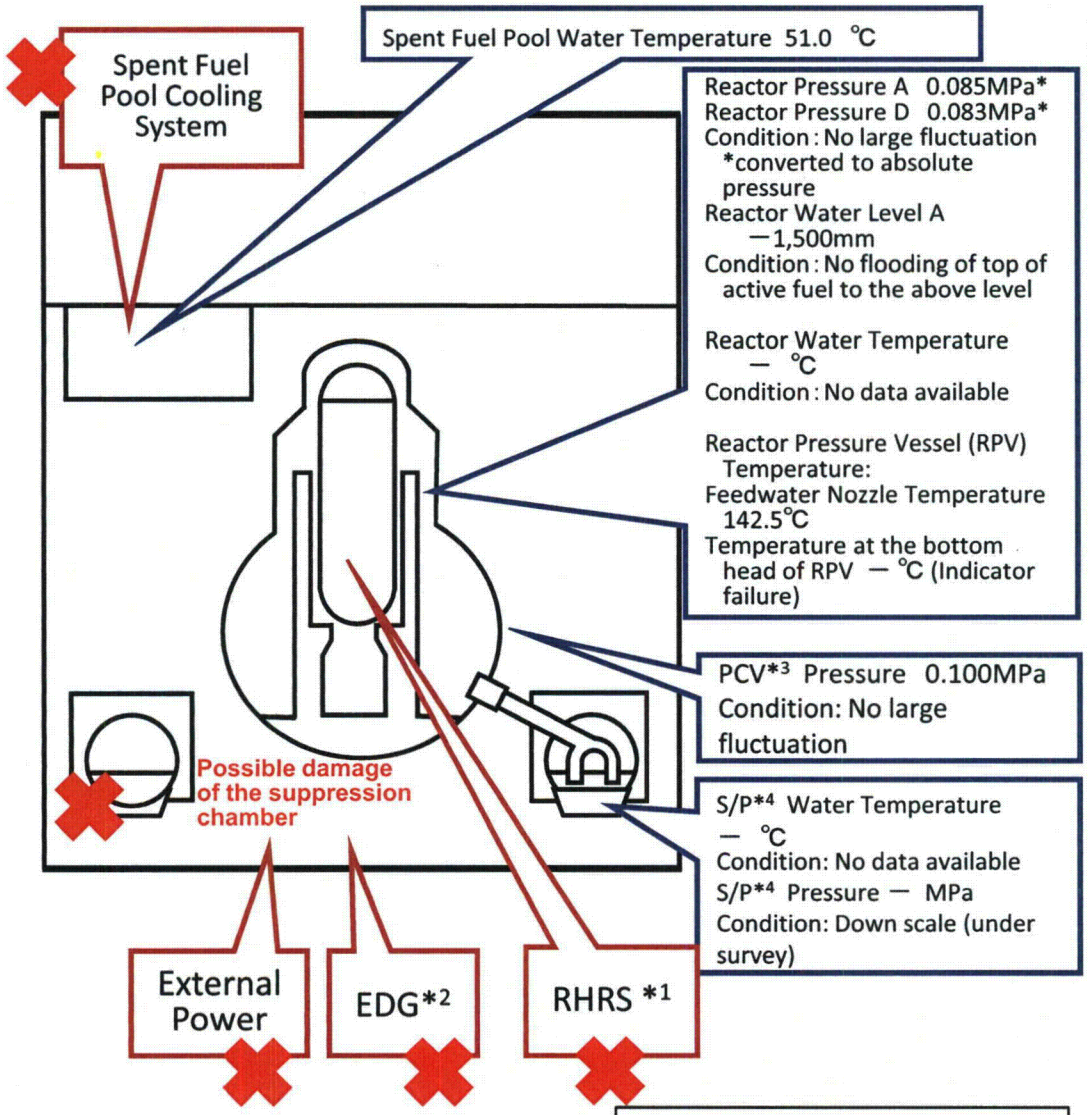
- 11th 14:46 Under operation, Automatic shutdown by the earthquake
- 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 12th 01:20 Occurrence of the Article 15 event (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.

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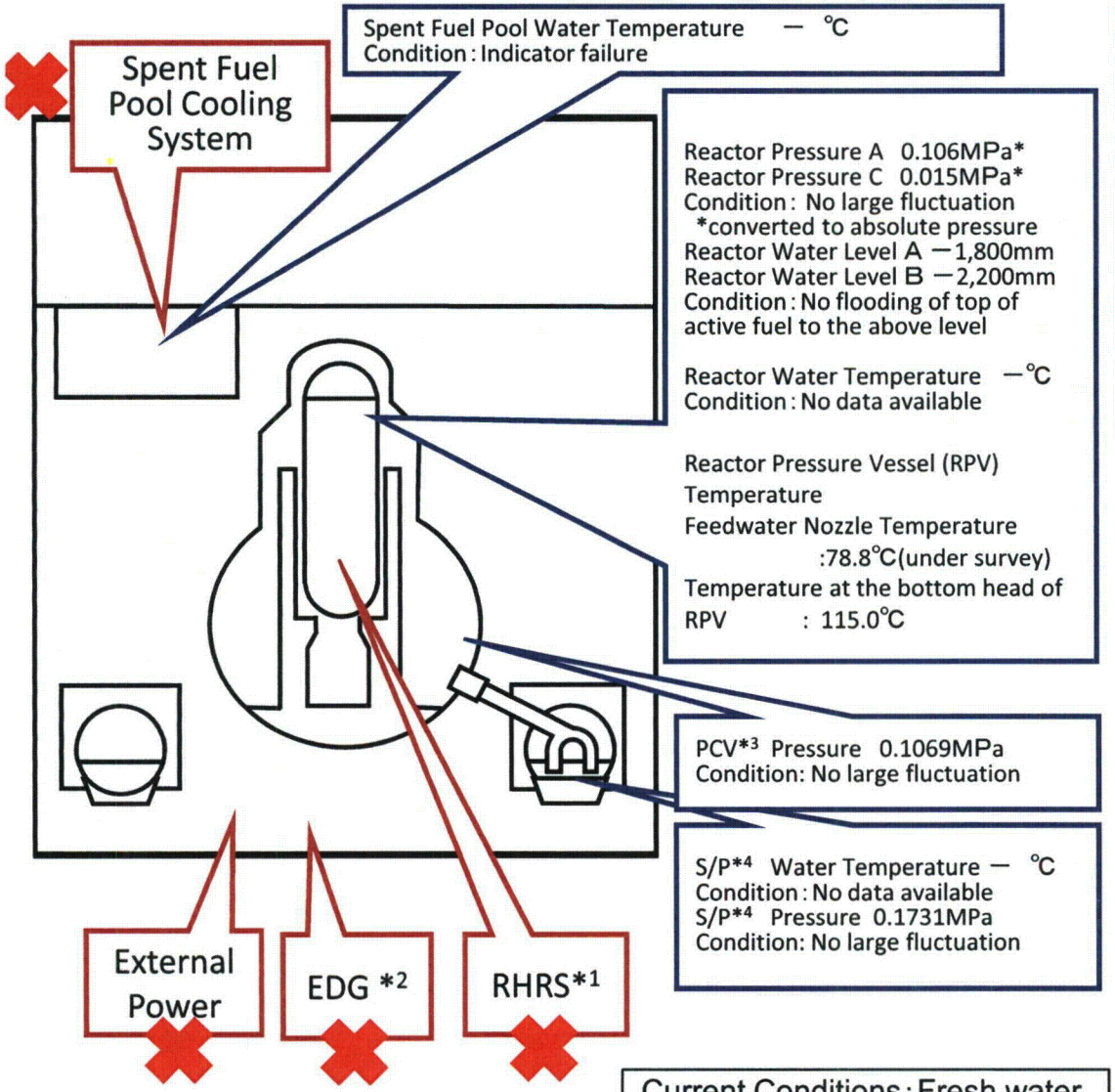
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

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.

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

(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

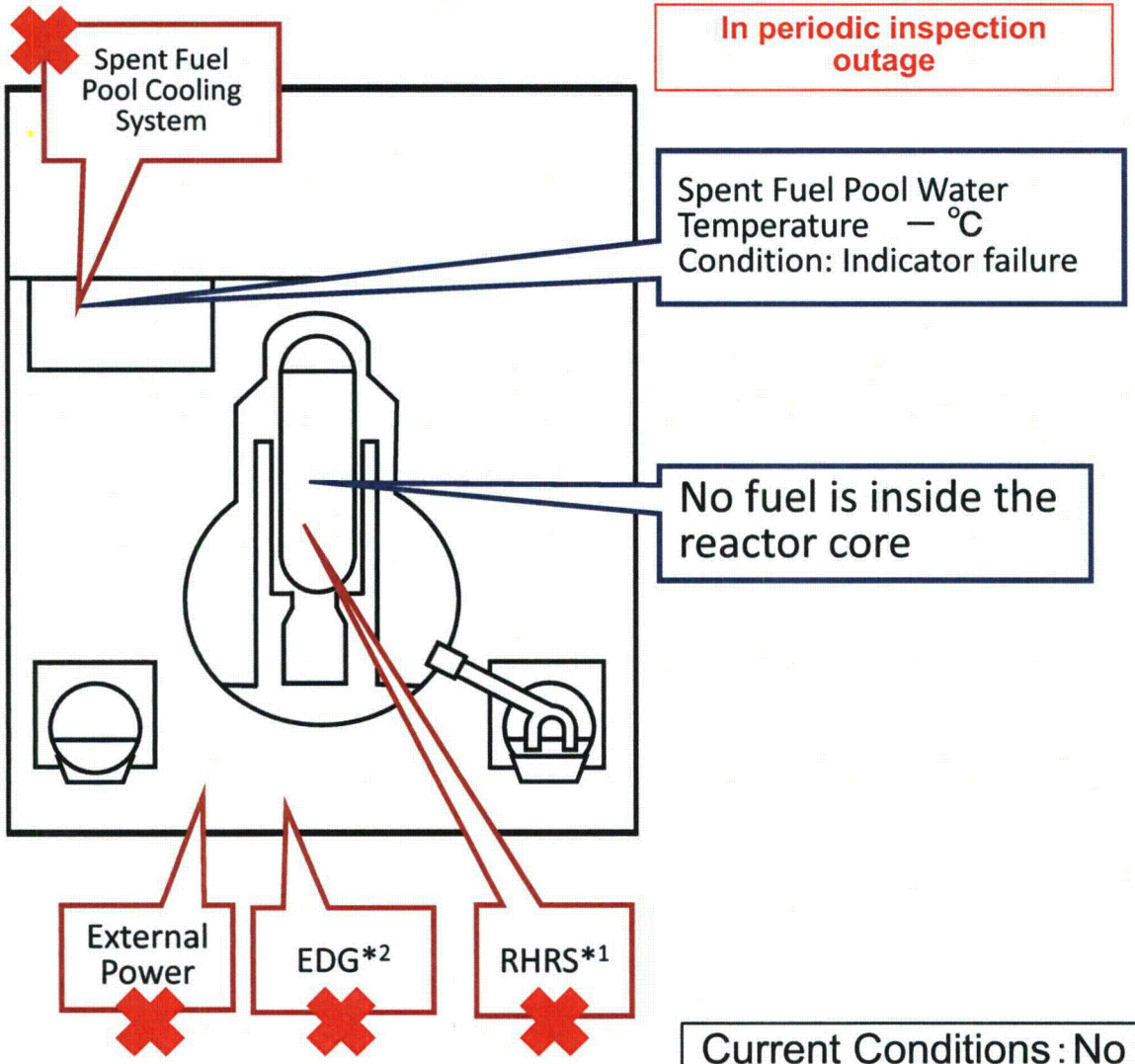
Major Events after the earthquake

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)
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

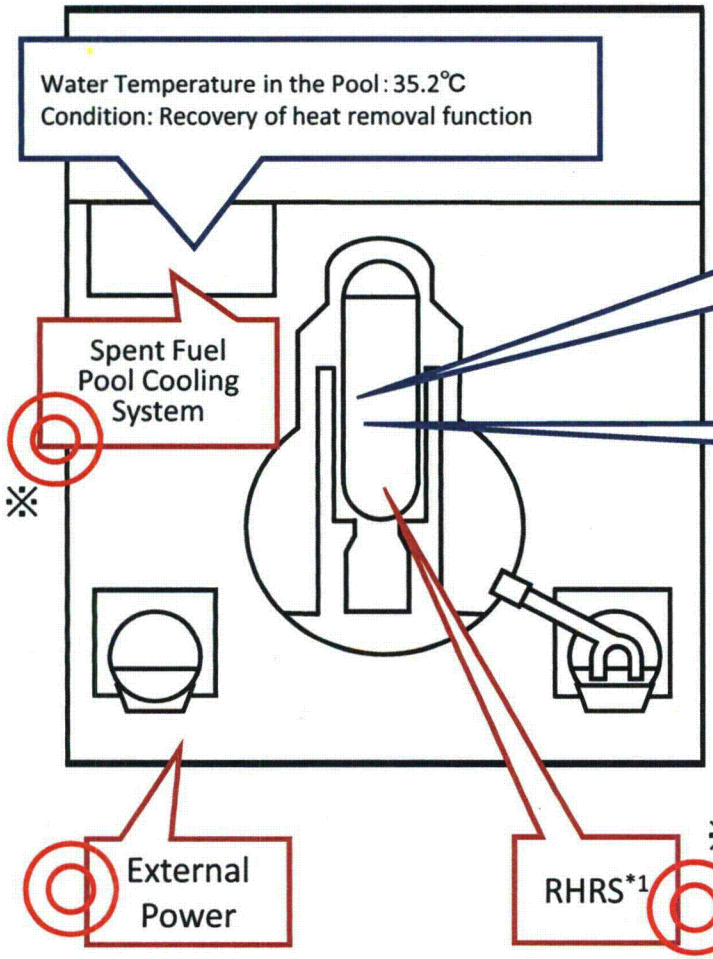
Water spray by Concrete Pump Truck (Fresh water)

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.

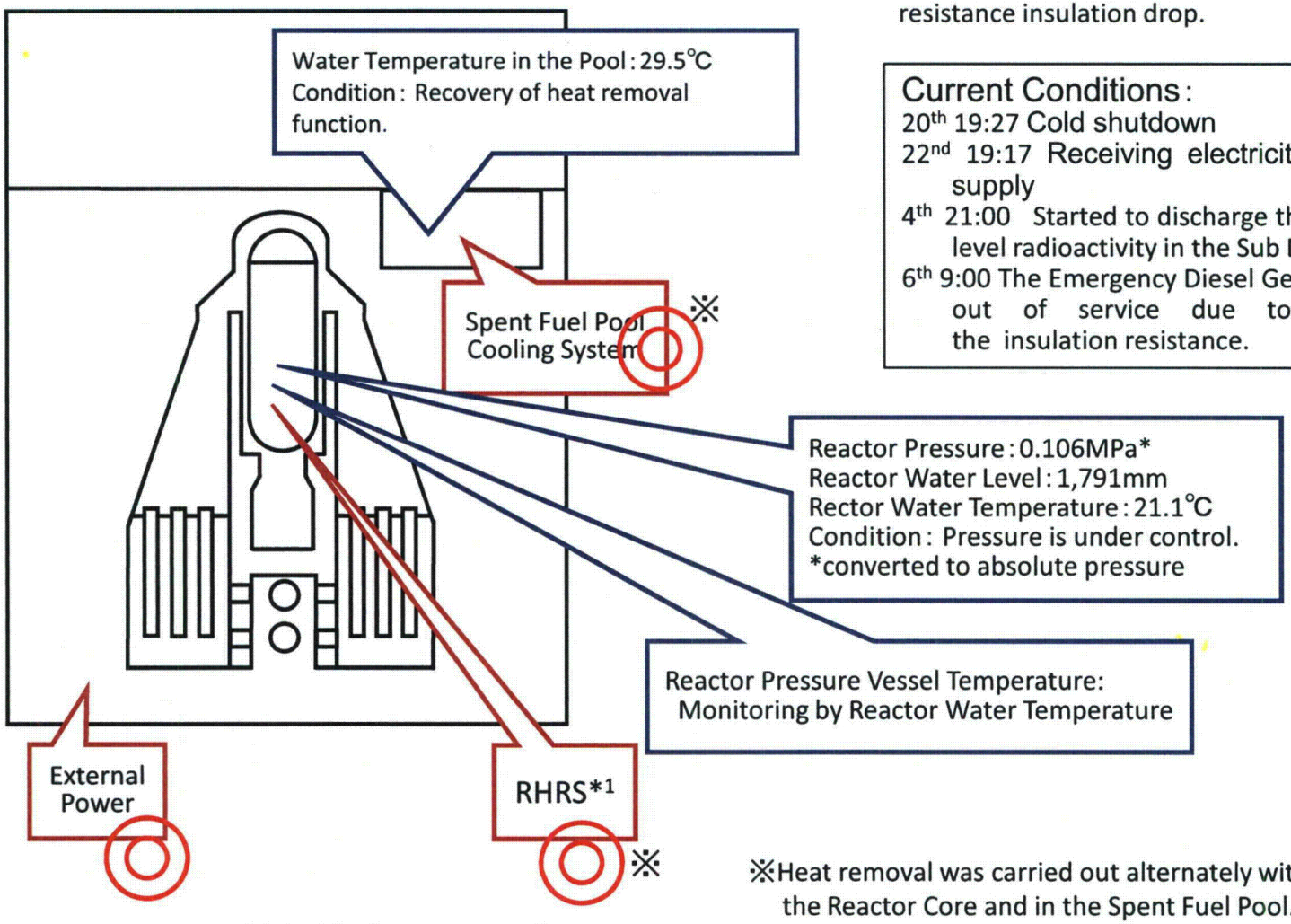
Current Conditions:

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.



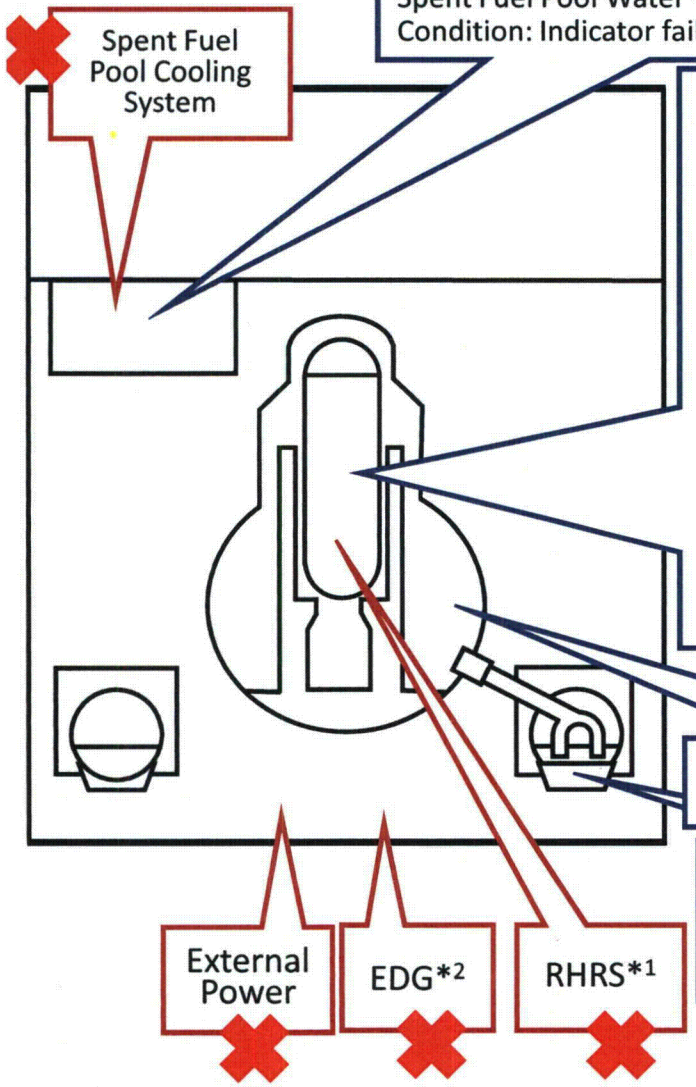
*1 Residual Heat Removal System

※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)



Spent Fuel Pool Water Temperature — ℃
Condition: Indicator failure

Reactor Pressure A 0.464MPa*
Reactor Pressure B 0.859MPa*
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 :216.3℃
Temperature at the bottom head of RPV :116.2℃

PCV*3 Pressure 0.155MPa
Condition: No large fluctuation

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

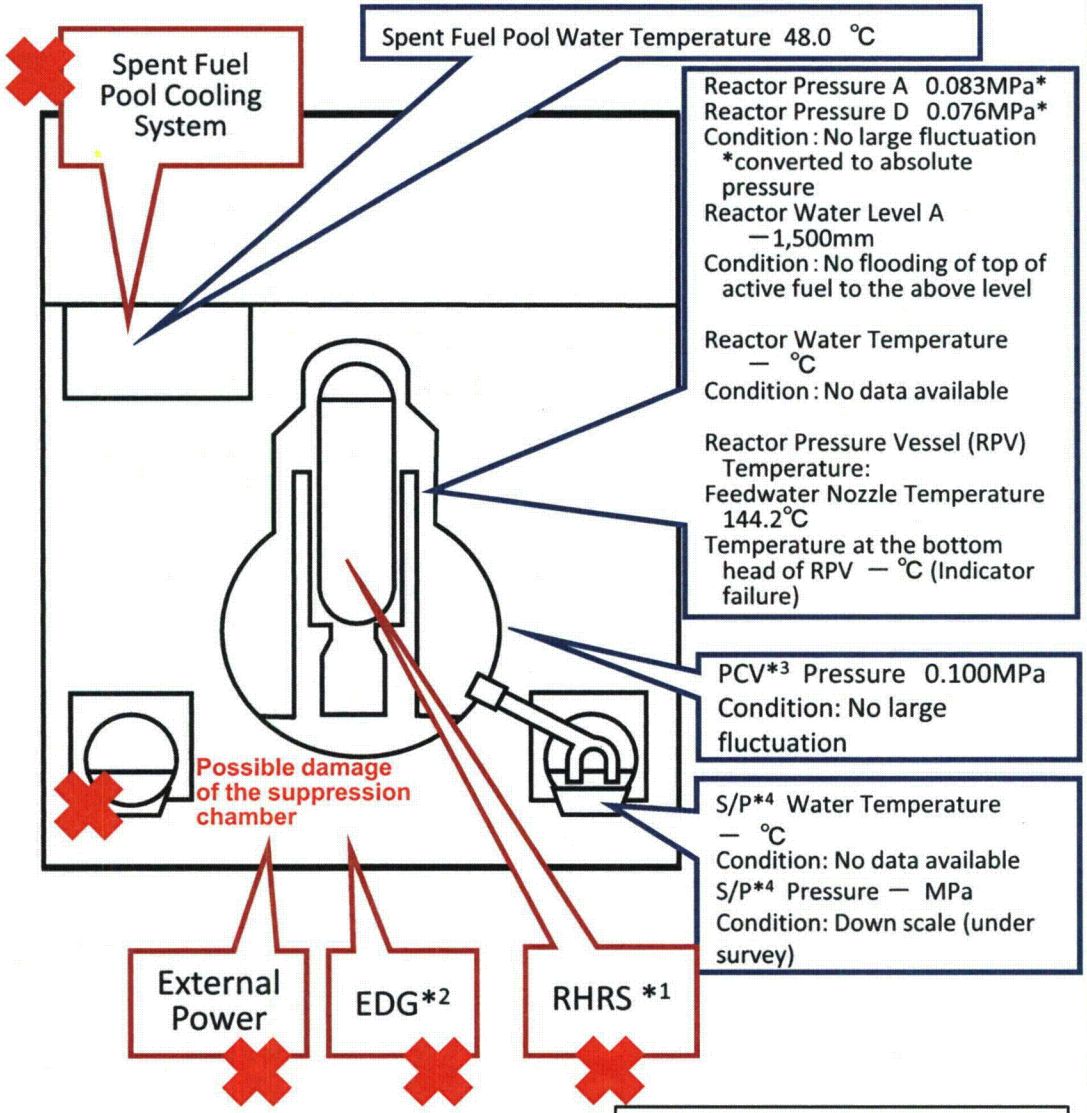
11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 15:42 Report based on the Article 10 (Total loss of A/C power)
11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
12th 01:20 Occurrence of the Article 15 event (Unusual 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 operation for injection of nitrogen to reactor containment
7th 01:31 Confirmed starting injection of nitrogen to reactor containment

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)



*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

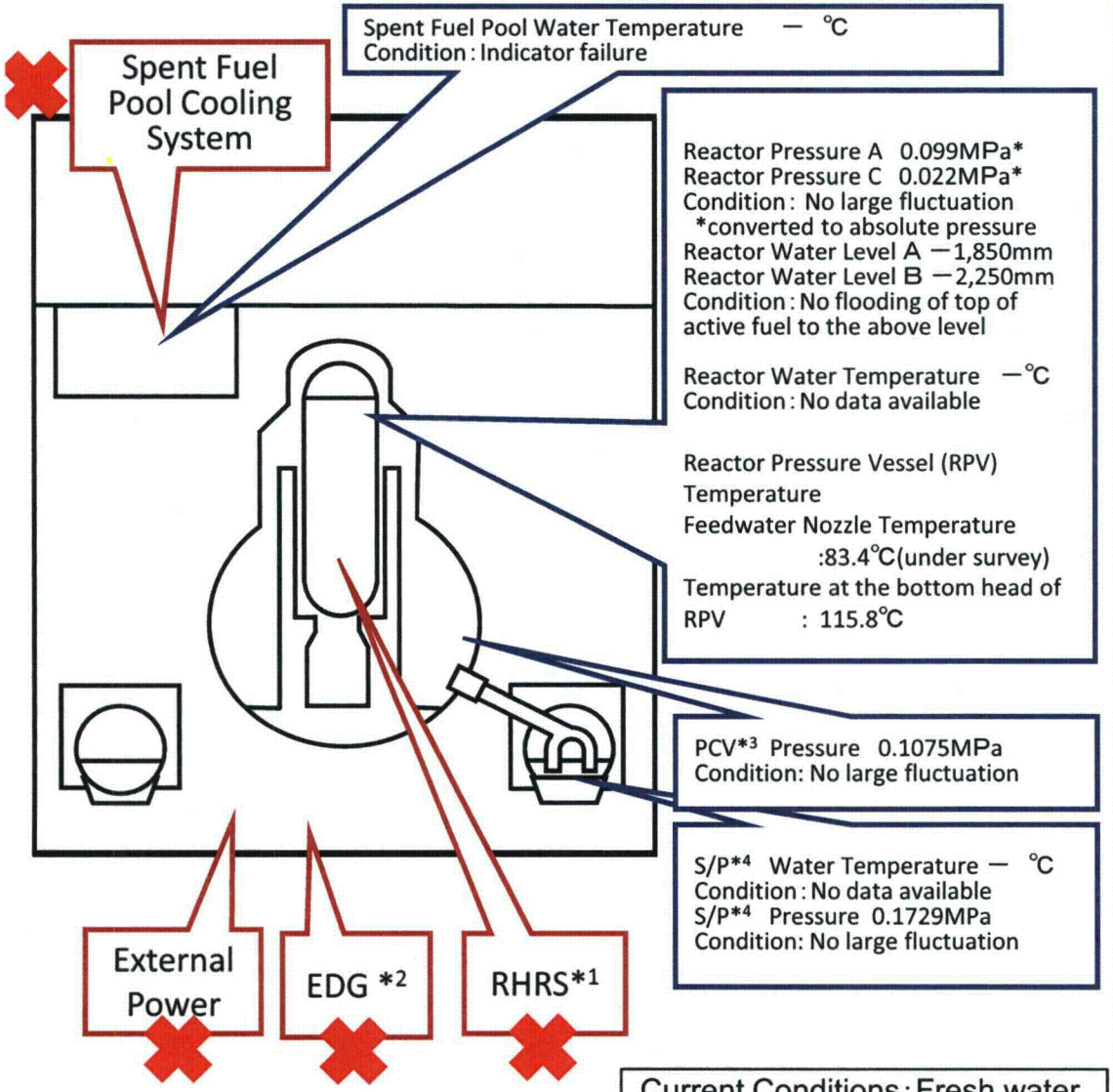
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

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.

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

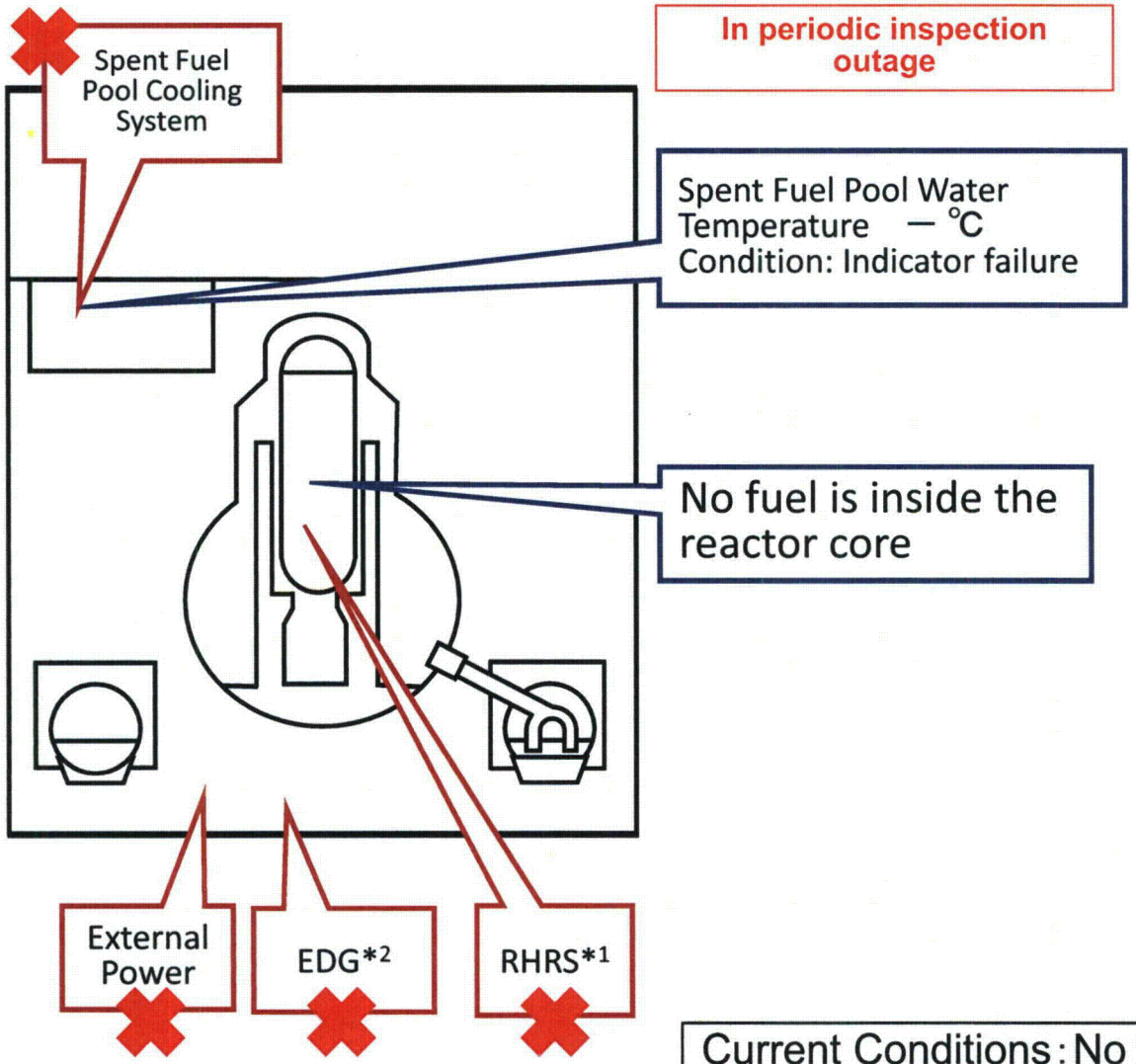
Major Events after the earthquake

11th 14:46 Under operation, Automatic shutdown by the earthquake
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 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

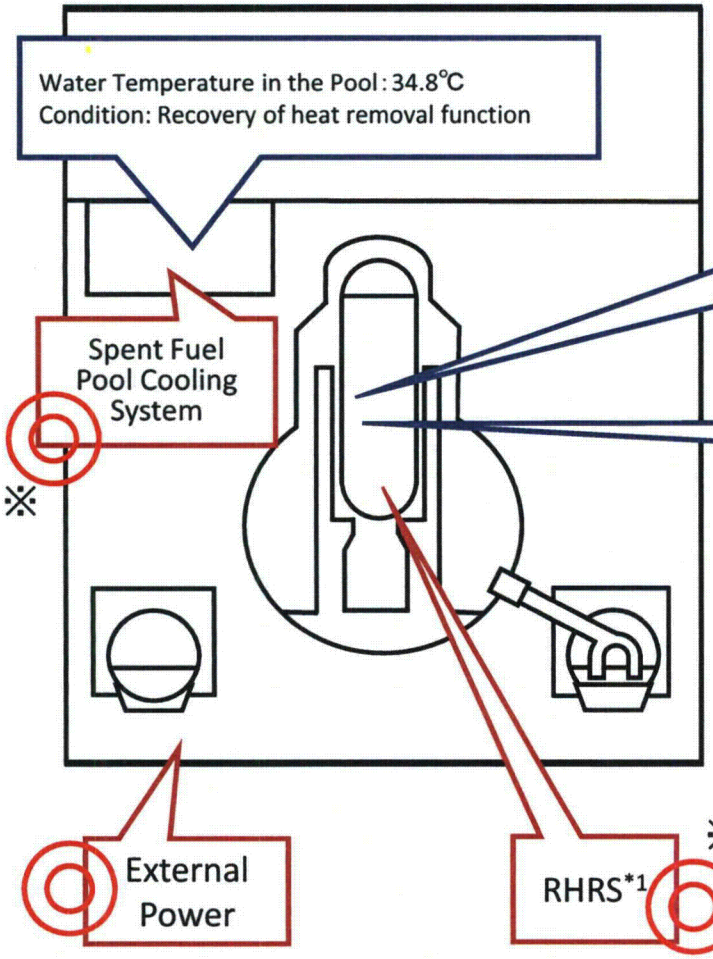
Water spray by Concrete Pump Truck (Fresh water)

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.

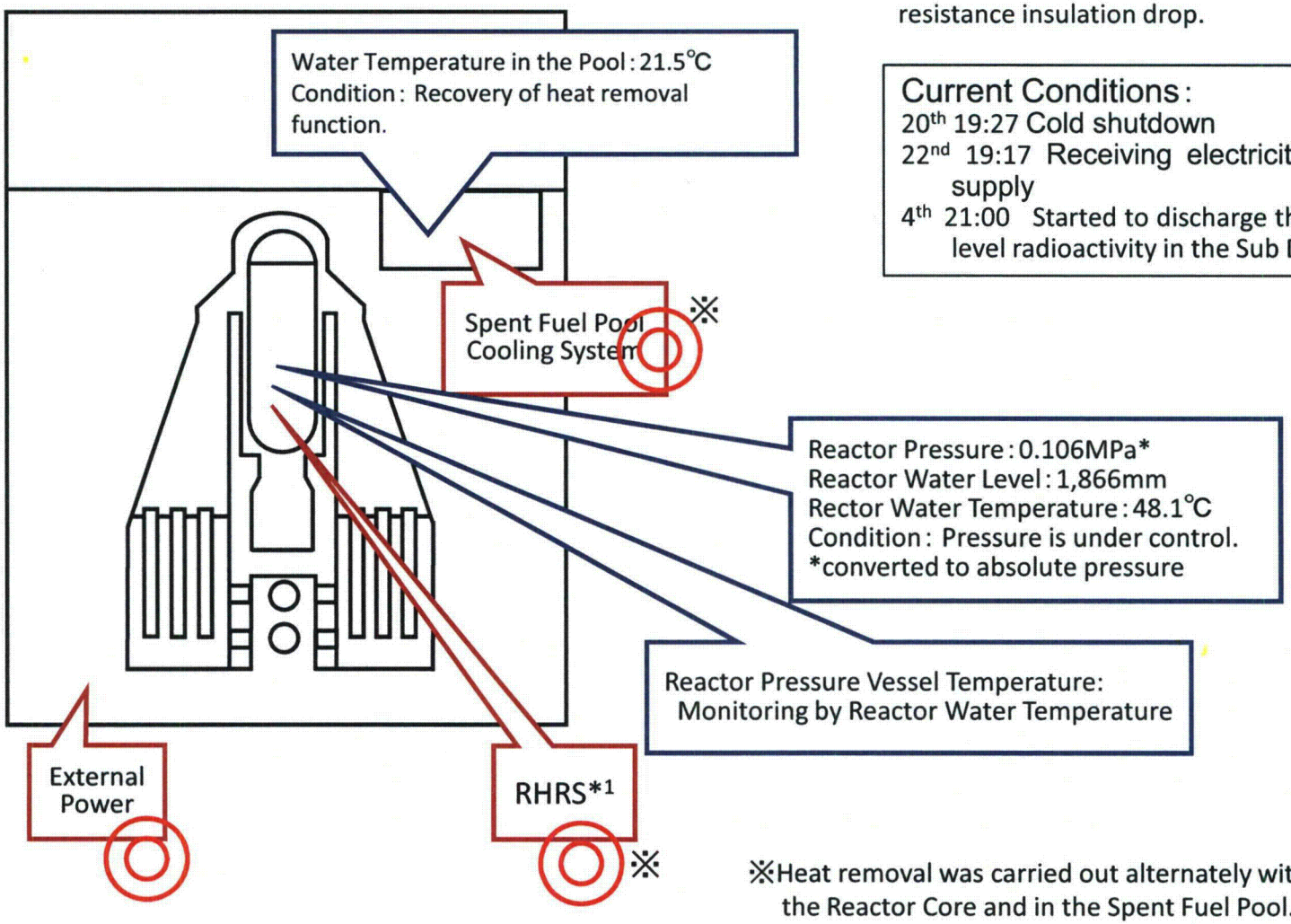
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

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)

経済産業省
Ministry of Economy, Trade and Industry

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

PPPP/150

(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, $2.1 \times 10^5 Bq/cm^3$ 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 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 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 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 07:20 April 8th, water temperature of the pool was around 28℃.

<Other>

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

  (As the result of measurement on 29 March, it was detected as 3,355.0 times higher than the limit in water (13:55 March 29th). On the other hand, as the result of the analysis at the northern side of the Water Discharge Canal of the NPS, 4.6×10^{1}Bq/cm^{3} of ^{131}I (Iodine) (1,262.5 times higher than the limit in water) was detected. (14:10 March 29th)
- The water was confirmed to be collected in the vertical parts of the trenches (an underground structure for laying pipes, shaped like a tunnel) outside of the turbine building of Units 1 to 3. The dose rates on the water surface were 0.4 mSv/h of the Unit 1's trench and 1,000 mSv/h of the Unit 2's trench. The rate of the Unit 3's trench could not measure because of the rubble. (Around 15:30 March 27th) The collected water in the vertical part of the trench outside of the turbine building of Unit 1

was transferred to the storage tank in the Main Building of Radioactive Waste Treatment Facilities by the temporary pump. Thereafter the water level from the top of the vertical part went down from approximately -0.14m to approximately -1.14m. (From 09:20 till 11:25 March 31st)

- In the samples of soil collected on 21 and 22 March on the site (at 5 points) of Fukushima Dai-ichi NPS, ^{238}P (Plutonium), ^{239}P (Plutonium) and ^{240}P (Plutonium) were detected (23:45 March 28th announced by TEPCO). The concentration of the detected plutonium was at the equivalent level of the fallout (radioactive fallout) that was observed in Japan concerning the past atmospheric nuclear testing, i.e. at the equivalent level of the normal condition of environment, and was not at the level of having harmful influence on human body.
- When removing the flange of pipes of Residual Heat Removal Seawater System outside the building of Unit 3, three subcontractor's employees were wetted by the water remaining in the pipe. However, as the result of wiping the water off, no radioactive materials were attached to their bodies. (12:03 March 29th)
- On March 28th, the stagnant water was confirmed in the Main Building of Radioactive Waste Treatment Facilities. As the result of analysis of radioactivity, the total amount of the radioactivity 1.2×10^1 Bq/cm^3 in the controlled area and that of 2.2×10^1 Bq/cm^3 in the non-controlled area were detected in March 29th.
- As the result of nuclide analysis at around the Southern Water Discharge Canal, 1.8×10^2 Bq/cm^3 of ^{131}I (Iodine) (4,385.0 times higher than the concentration limit in water outside the Environmental Monitoring Area) was detected (13:55 March 30th).
- The barge (the first ship) of the US armed forces carrying fresh water for cooling reactors, etc. landed in the exclusive port of the power station, being towed by the ships of Maritime Self-Defense Force. (15:42 March 31st) The transfer of fresh water from the barge (the first ship) to the Filtrate Tank was started. (15:58 April 1st) Thereafter it was suspended due to the malfunction of the hose (16:25 April 1st), but was resumed on April 2nd. (From 10:20 till 16:40 April 2nd)
- The permanent monitoring posts (No.1 to 8) installed near the Site Boundary were recovered. (March 31st) They are measuring once a day.

- The spraying for test scattering of antiscattering agent was carried out in the area of about 500 m^2 on the mountain-side of the Common Pool. (From 15:00 till 16:05 April 1st)
- The barge (the second ship) of the US armed forces carrying fresh water for cooling reactors, etc. landed in the exclusive port of the power station, being towed by the ships of Maritime Self-Defense Force. (9:10 April 2nd)
- The freshwater was transferred from the barge (the second ship) of the US armed force to the barge (the first ship). (From 09:52 till 11:15 April 3rd)
- The stagnant water with low-level radioactivity in the Main Building of Radioactive Waste Treatment Facilities (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.

(Contact Person)
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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	

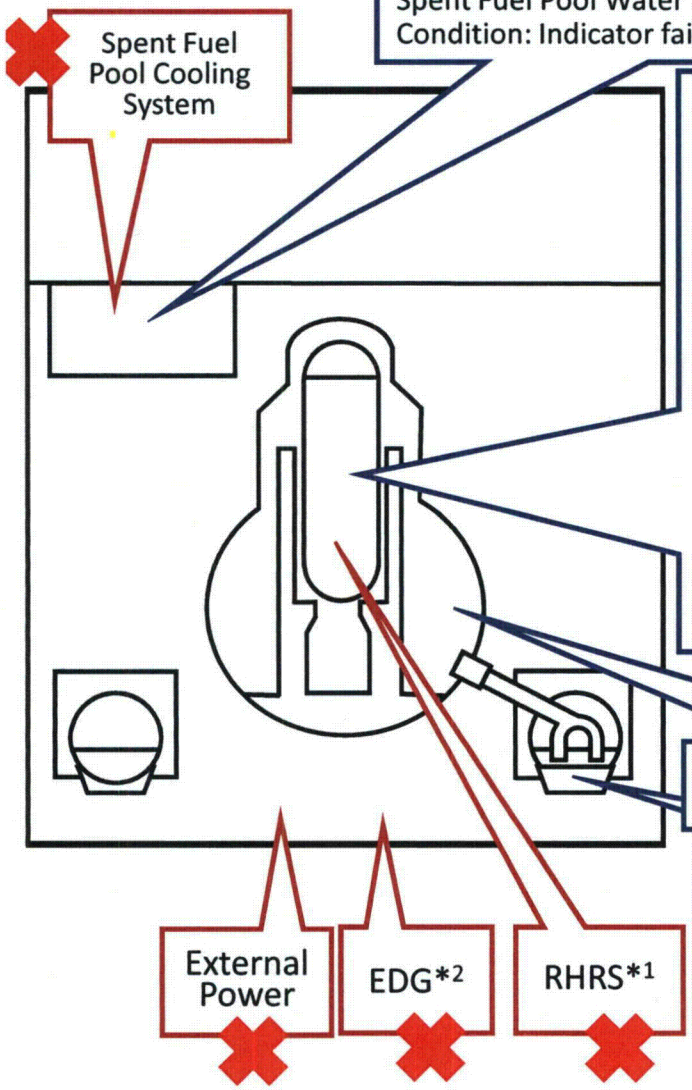
Other information	Unit2: Confirmed the indicated value of S/C Pressure but continuing to survey the transition of condition Unit3: Collecting the data of RPV temperature and continuing survey for transitional situation	Common pool: about 28 ℃ (As of 7:45, April 7th)	Unit5: SHC*5 mode (From 19:20 April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

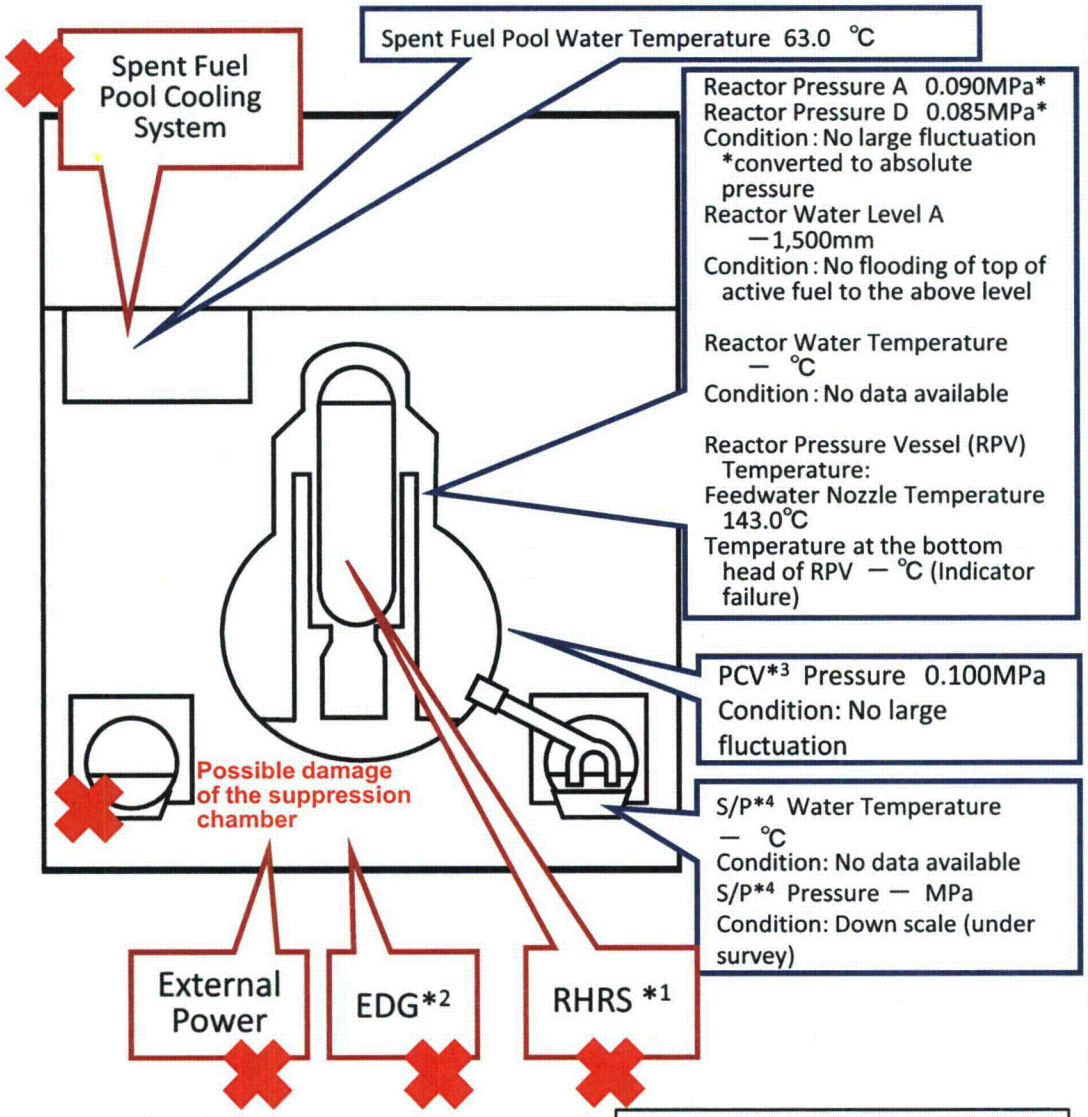
11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 15:42 Report based on the Article 10 (Total loss of A/C power)
11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
12th 01:20 Occurrence of the Article 15 event (Unusual 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

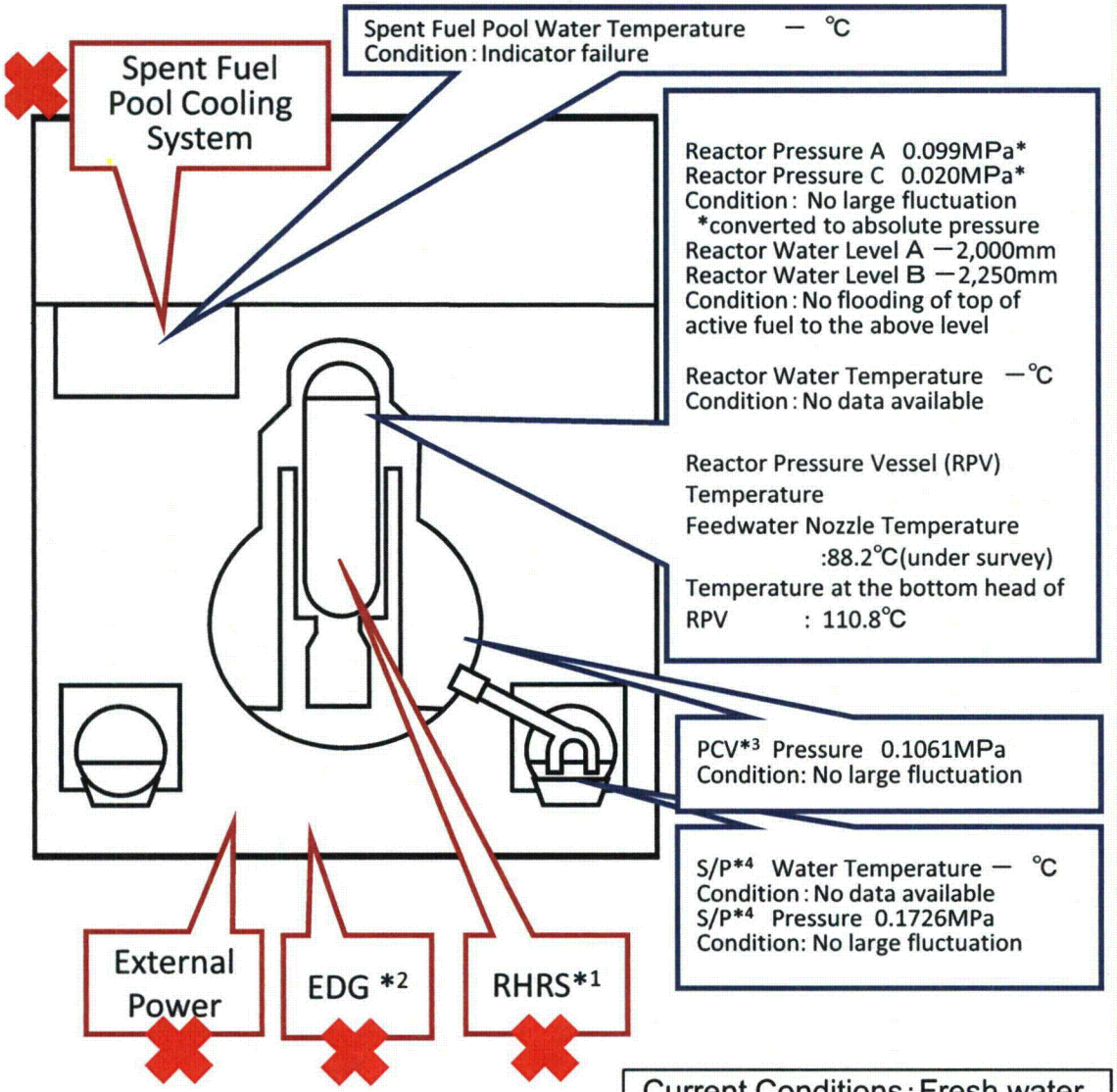
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

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)



*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

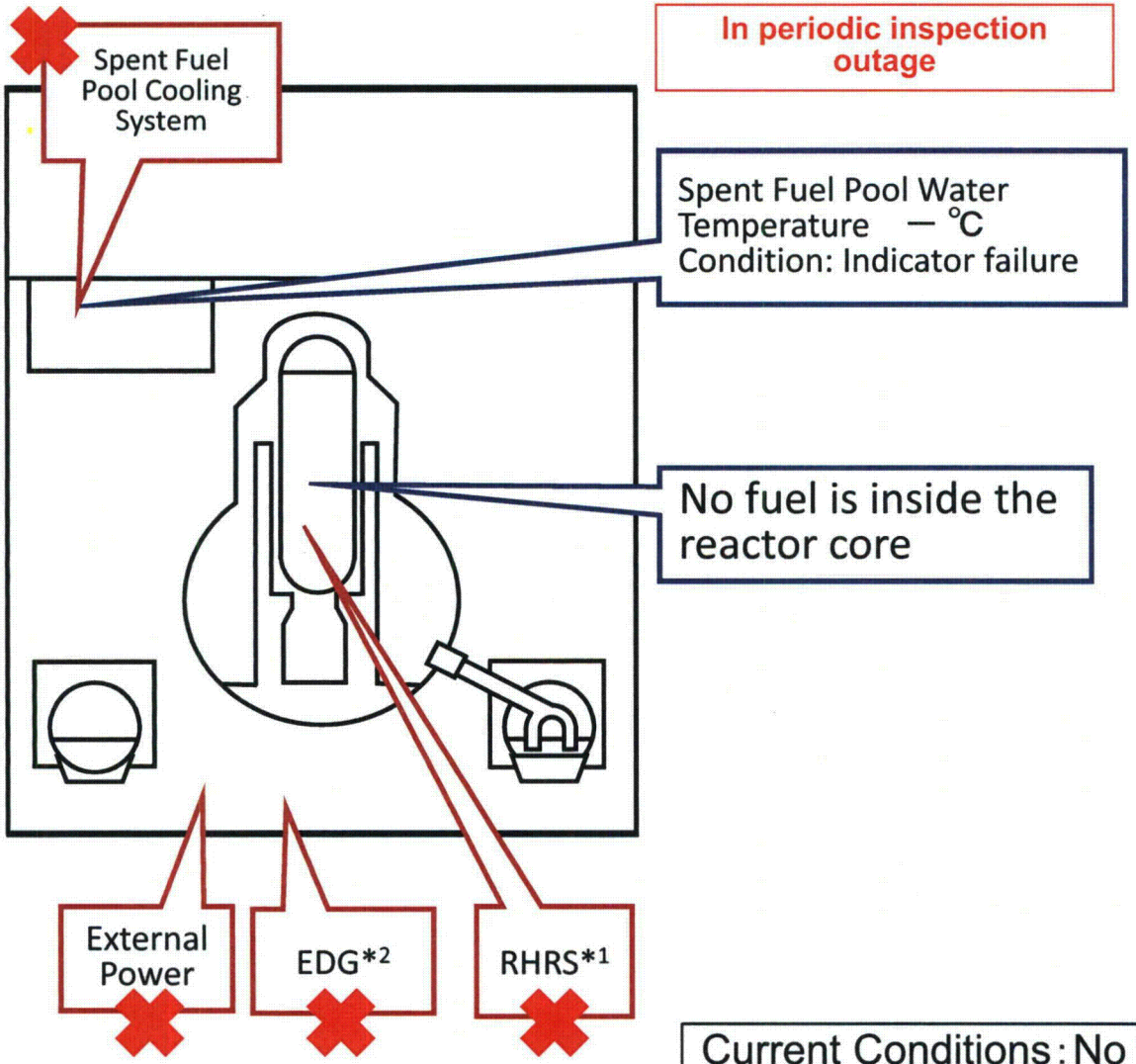
Major Events after the earthquake

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.

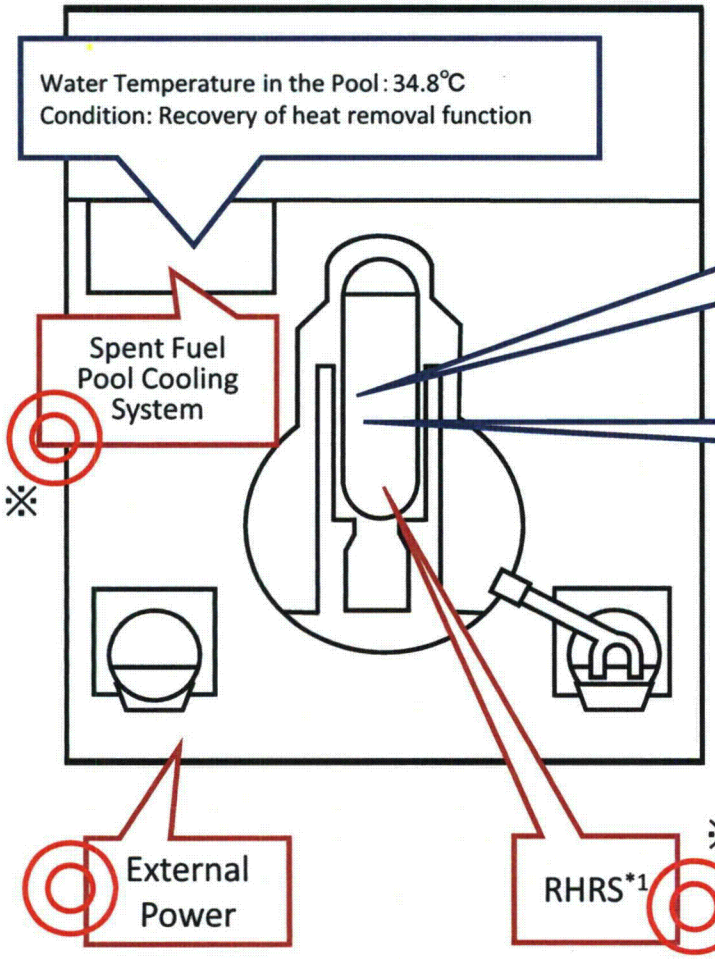
30th 14:04～18:33, 1st 8:28～14:14, 3rd 17:14～22:16, 5th 17:35～18:22, 7th 18:23～19:40 Water spray by Concrete Pump Truck (Fresh water)

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



Reactor Pressure : 0.103MPa*
Reactor Water Level : 1,669mm
Reactor Water Temperature : 33.2℃
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.

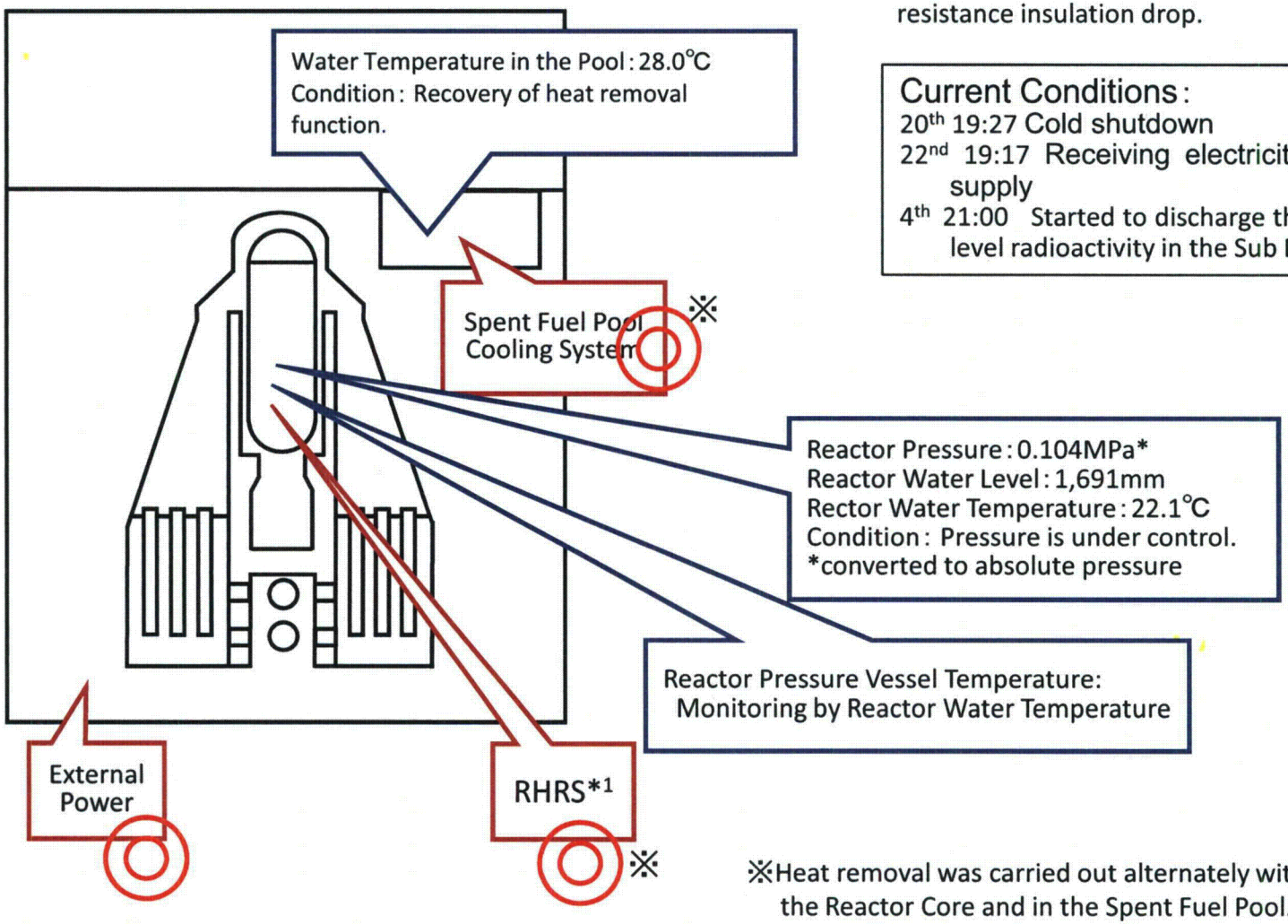
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 6:00 April 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



*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)

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)

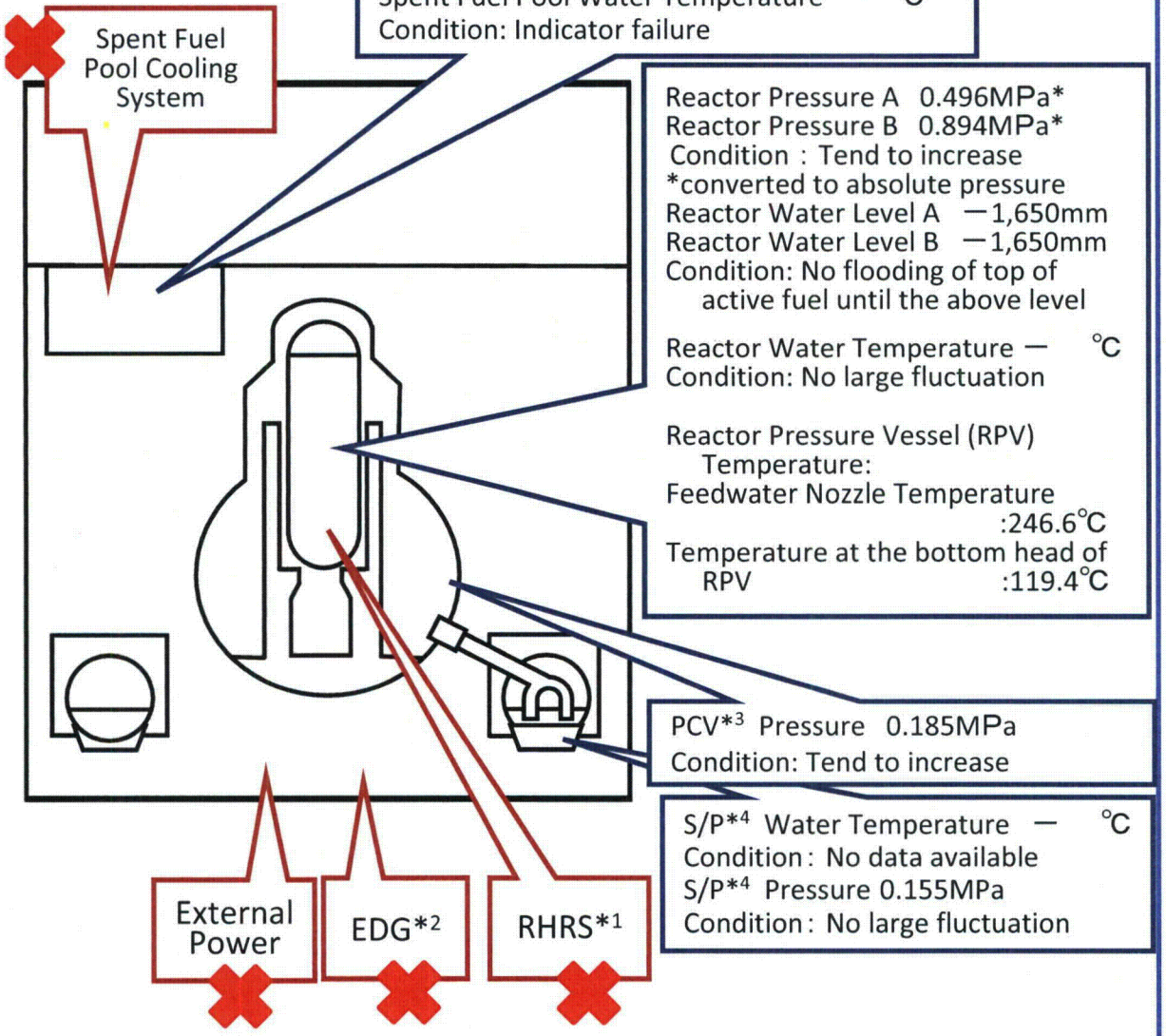
Pressure conversion	Gauge pressure (MPa g) = Absolute pressure (MPa abs) – Atmospheric pressure (Normal atmospheric pressure 0.1013MPa) Absolute pressure (MPa abs) = Gauge pressure (MPa g) + Atmospheric pressure (Normal atmospheric pressure 0.1013MPa)

(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

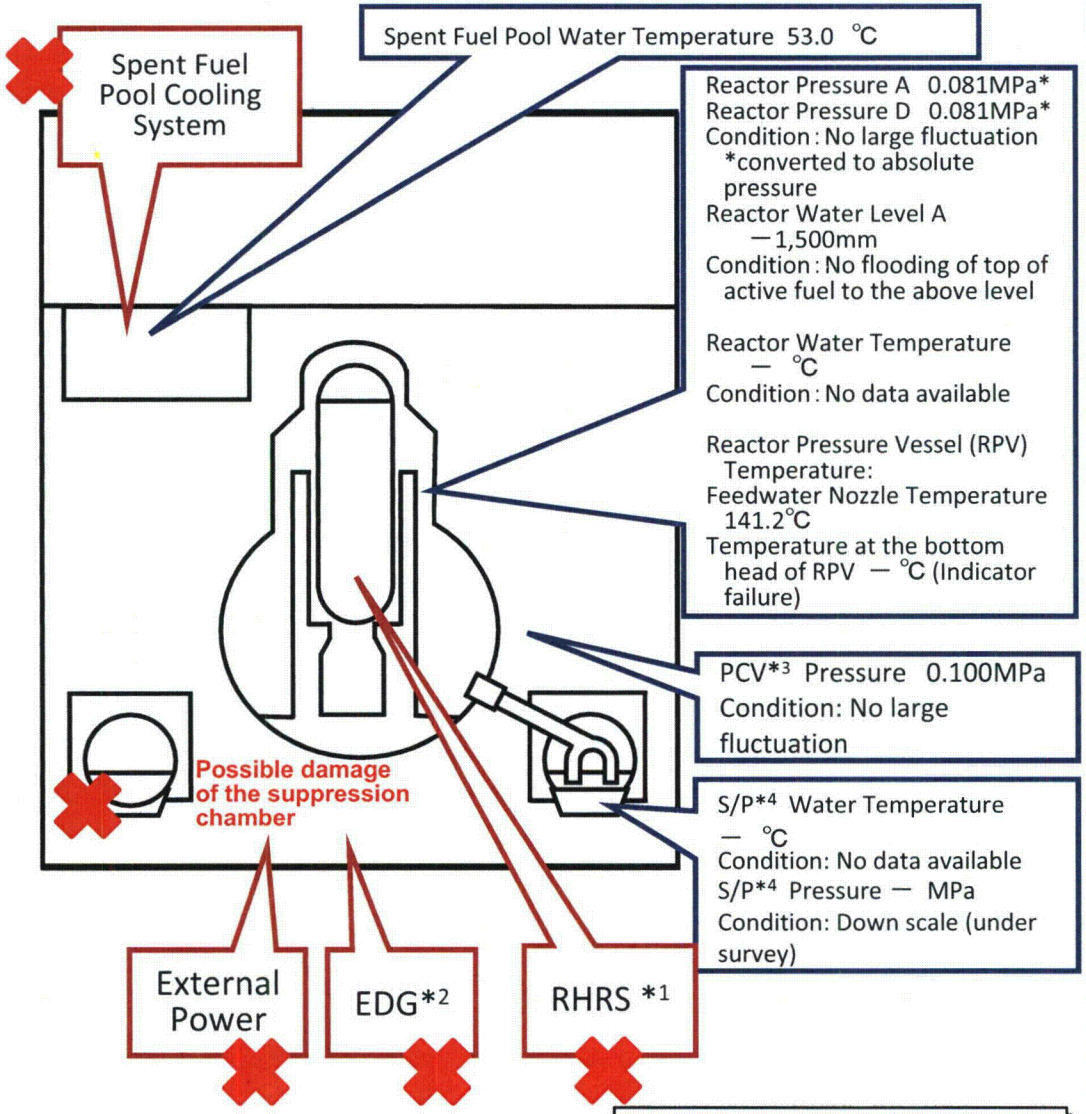
11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 15:42 Report based on the Article 10 (Total loss of A/C power)
11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
12th 01:20 Occurrence of the Article 15 event (Unusual 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

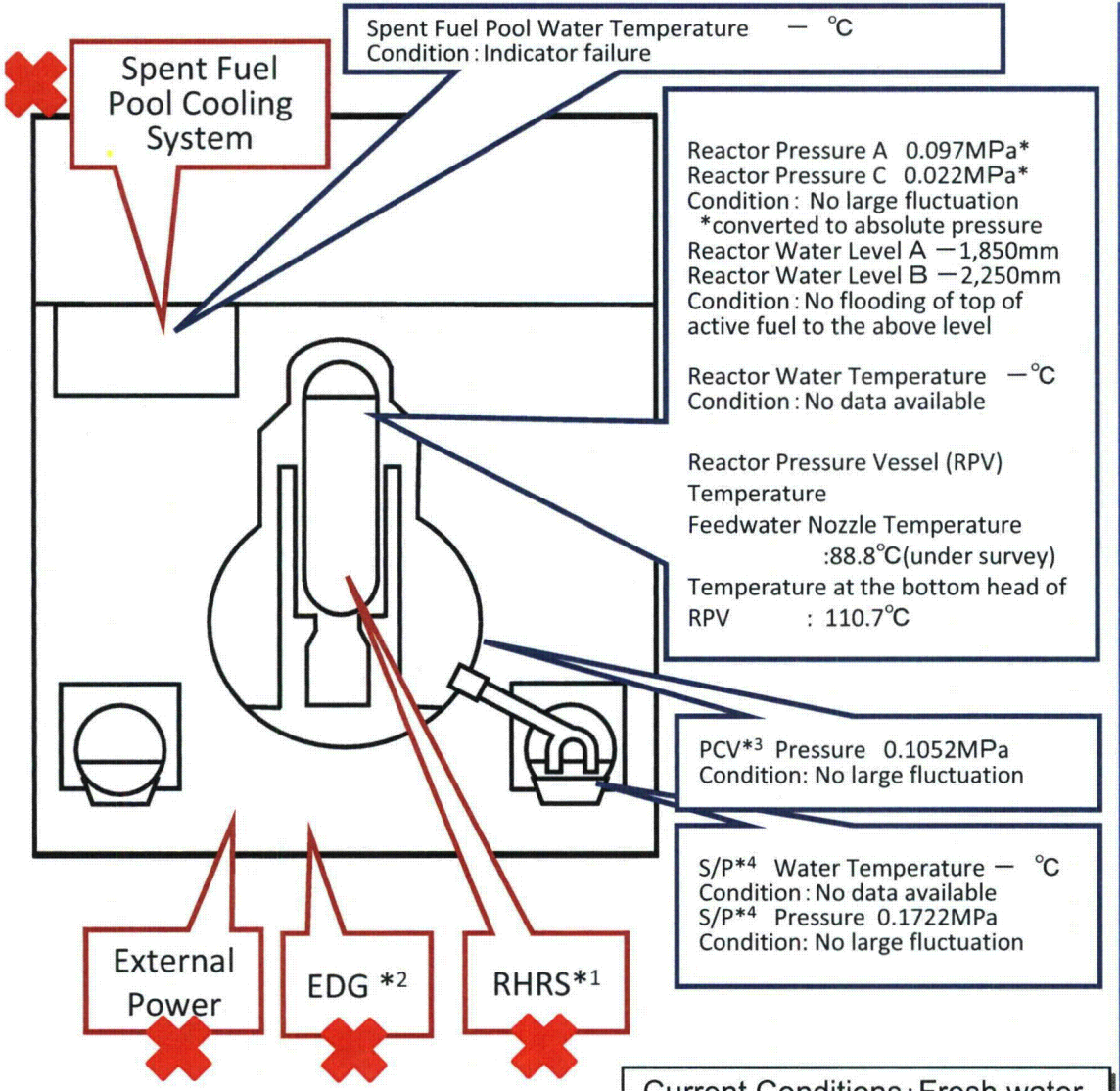
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

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)



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

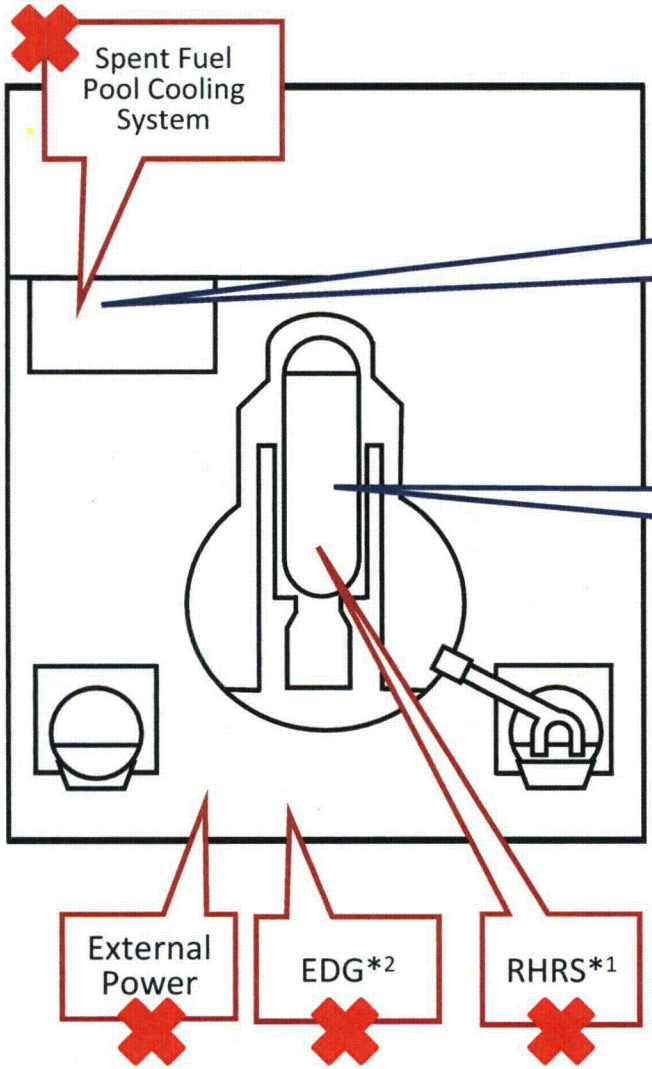
Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the core

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)



In periodic inspection outage

Spent Fuel Pool Water Temperature — ℃
Condition: Indicator failure

No fuel is inside the reactor core

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

Major events after the earthquake

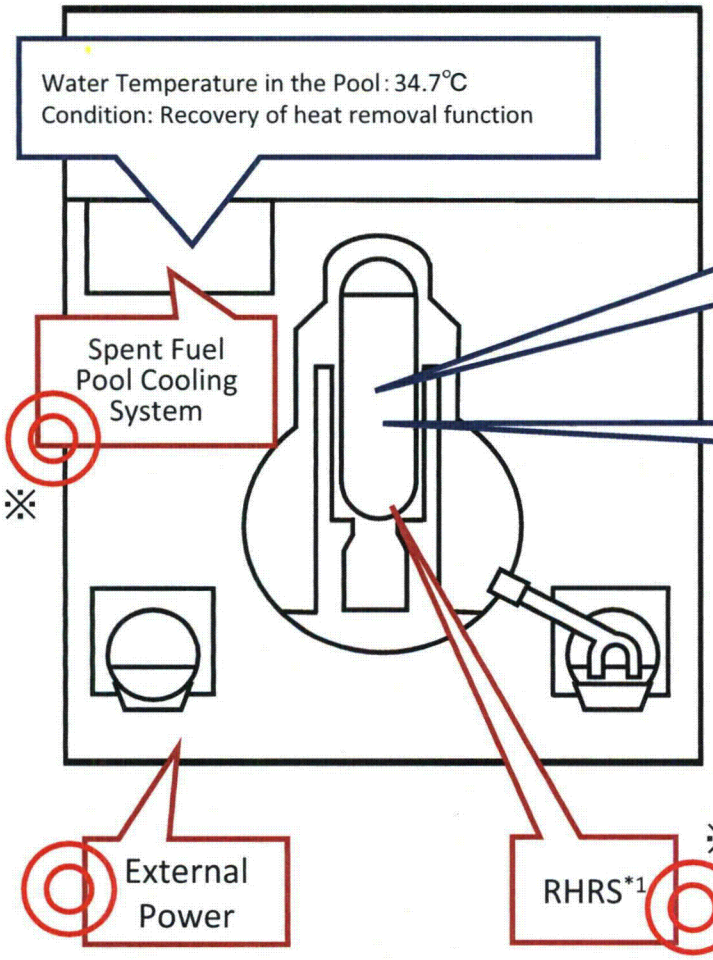
In periodic inspection outage when the earthquake occurred
14th 04:08 Water temperature in the Spent Fuel Pool (SFP), 84℃
15th 06:14 Confirmed the partial damage of wall in the 4th floor.
15th 09:38 Fire occurred in the 3rd floor. (12:25 extinguished)
16th 05:45 Fire occurred. TEPCO couldn't confirm any fire on the ground. (06:15)
20th 08:21～09:40 Water spray over SFP by Self-Defense Force
20th around 18:30～19:46 Water spray over SFP by Self-Defense Force
21st 06:37～08:41 Water spray over SFP by Self-Defense Force
21st 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

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.

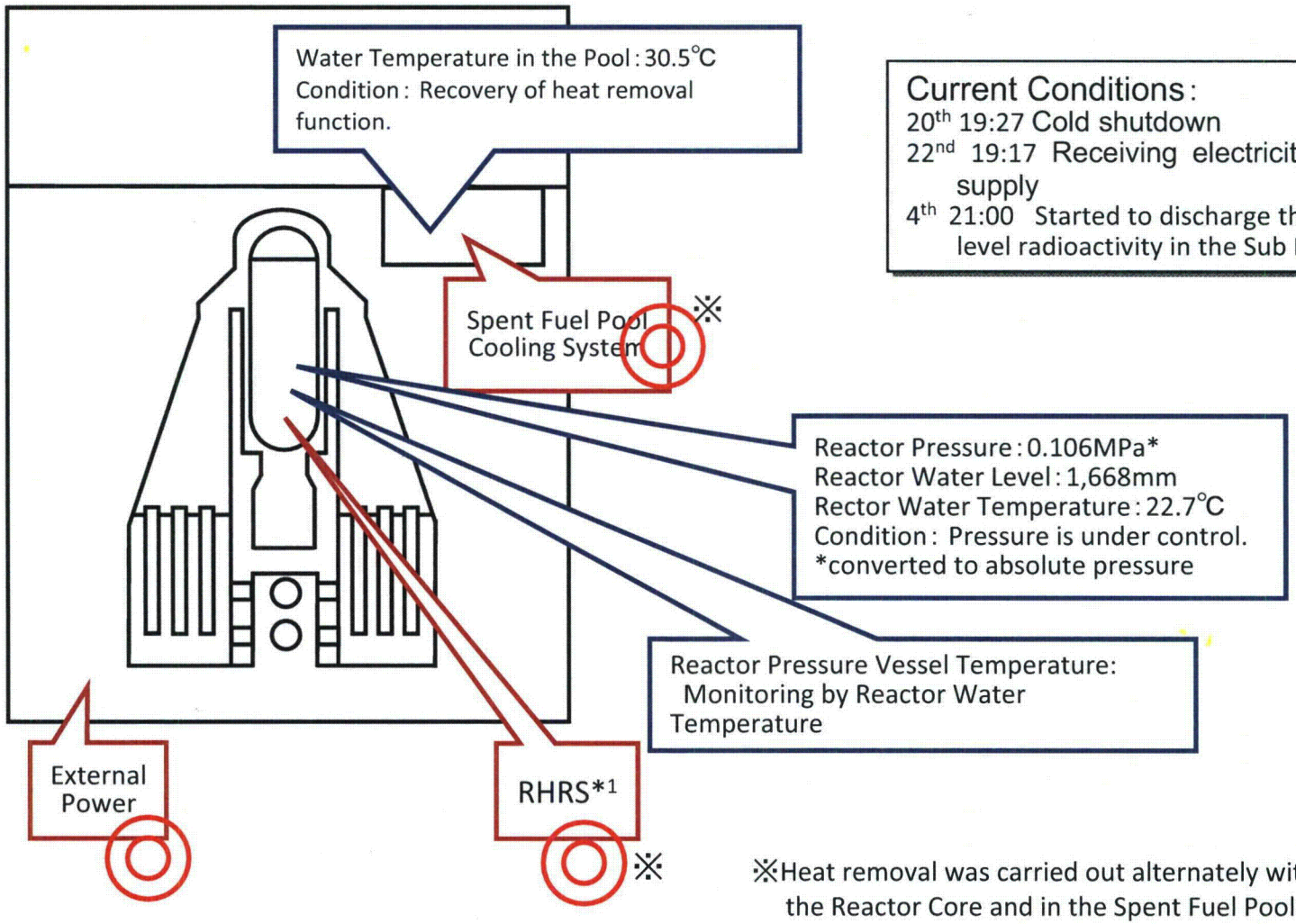
24th 16:35 Started to cooling.

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

*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)

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	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)	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(μSv/h)*1	681	–	–	683	–	–	685	–	–	684	–	–	675	–	–	682	–	–	679	–	–	679	–	–
	⑦MG(μSv/h)*2	99	–	–	97	–	–	97	–	–	98	–	–	97	–	–	98	–	–	97	–	–	97	–	–
	③WG(μSv/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(μSv/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					
	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	675	–	–	676	–	–	676	–	–	677	–	–	677	–	–	676	–	–	676					
	⑦MG(μSv/h)*2	95	–	–	97	–	–	97	–	–	96	–	–	97	–	–	97	–	–	96					
	③WG(μSv/h)*3	43.1	–	–	43.1	–	–	42.8	–	–	43.0	–	–	42.9	–	–	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					
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					

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)																								
	neutron																								
TM	⑥SMOB(μSv/h)*1																								
	⑦MG(μSv/h)*2																								
	③WG(μSv/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(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

April 7th, 2011

Fukushima Dai-ichi Monitoring points

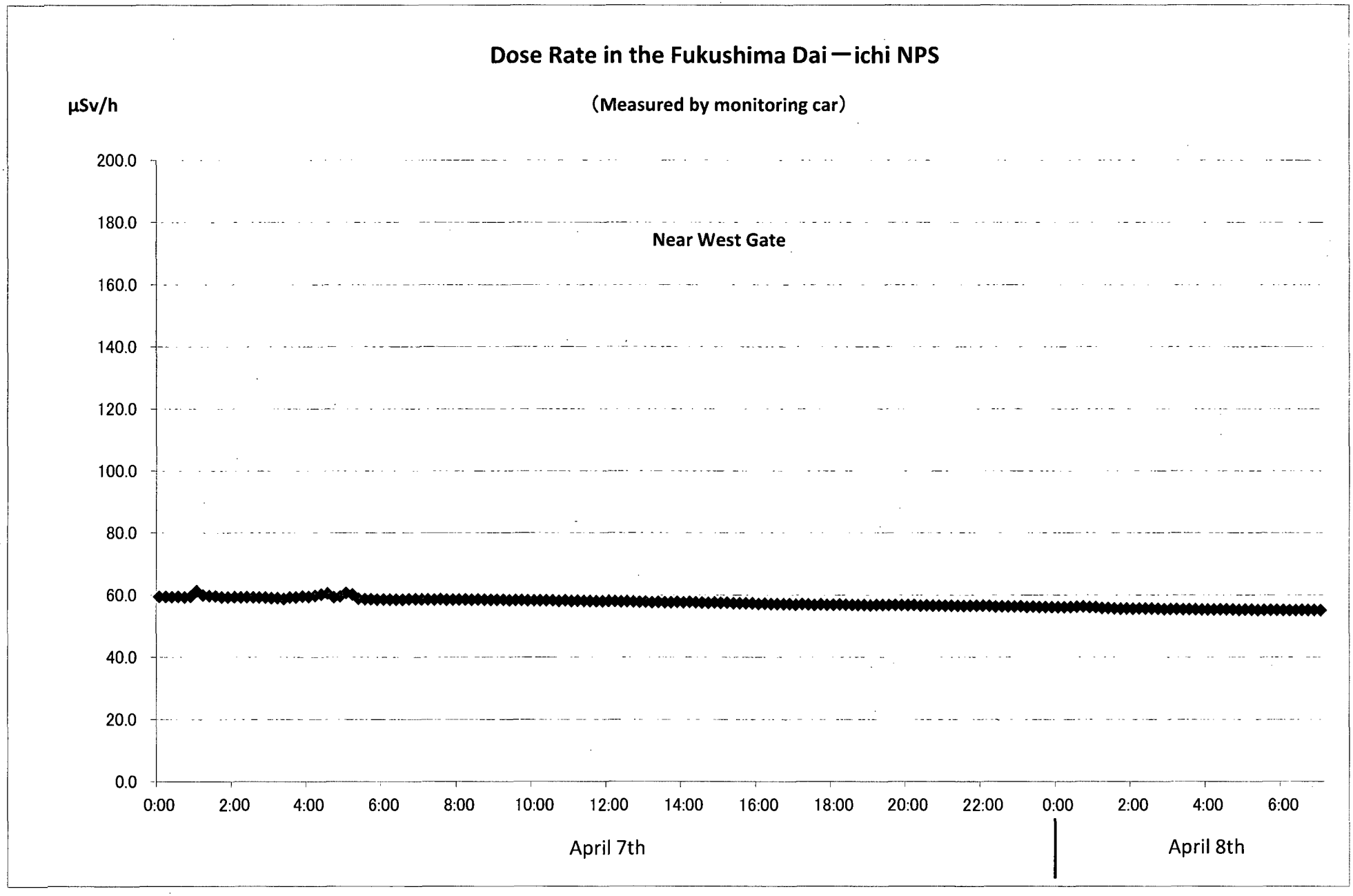
① North side of main office building(approx. 0.5km from Unit 2 in northwest direction)
② Near Gymnasium(East side of MP-5) (approx. 0.9km from Unit 2 in westnorthwest direction)
③ Near West Gate (near MP-5) (approx. 1.1km from Unit 2 in west direction)
④ Front of near Main Gate (near MP-6) (approx. 1.0km 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

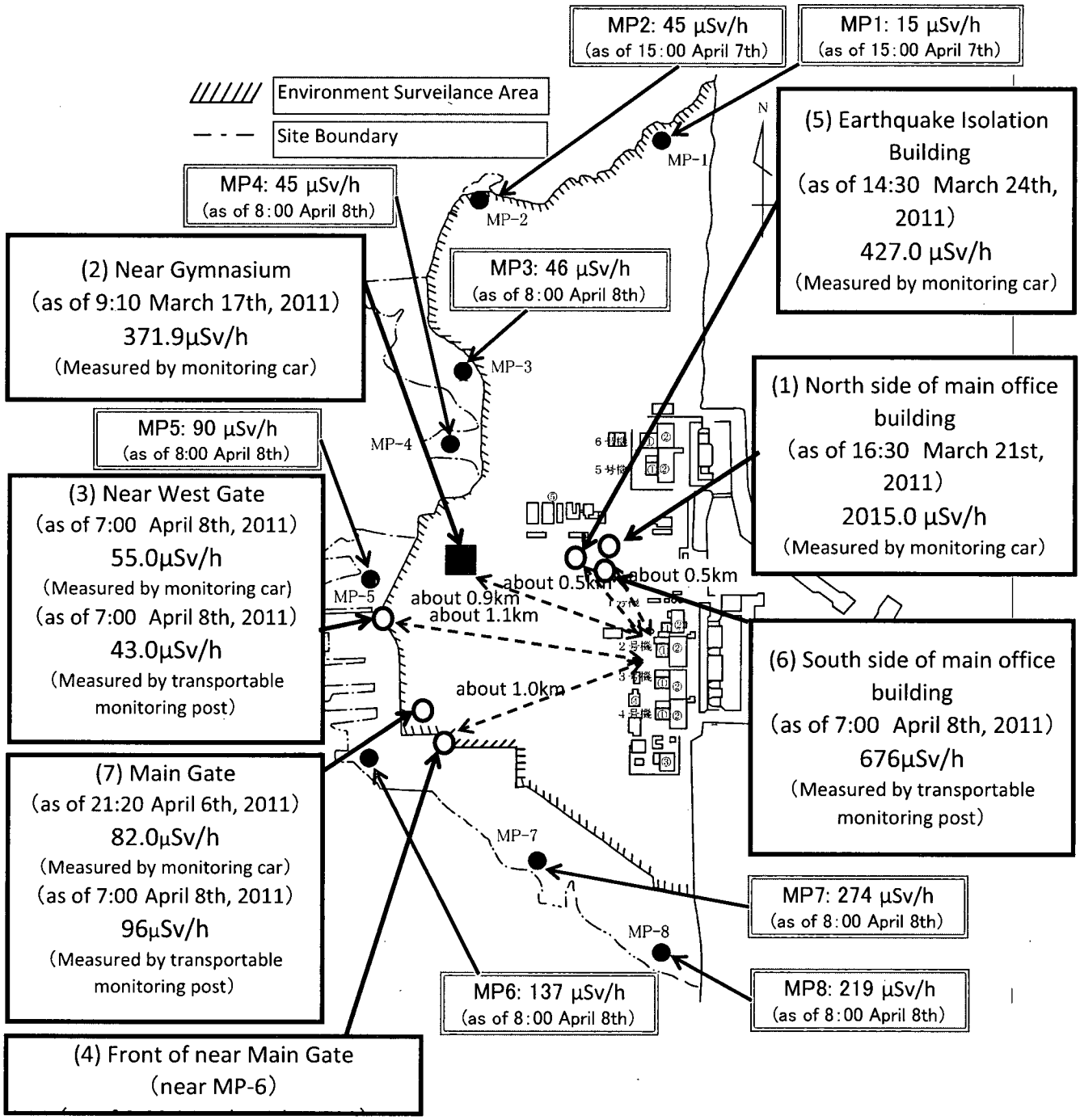
Monitoring points		③																							
Reading time		4:00	4:10	4:20	4:30	4:40	4:50	5:00	5:10	5:20	5:30	5:40	5:50	6:00	6:10	6:20	6:30	6:40	6:50	7:00	7:10	7:20	7:30	7:40	7:50
MC	Reading(μSv/h)	59.4	59.7	60.1	60.5	59.2	59.5	60.6	60.1	58.8	58.6	58.6	58.5	58.5	58.5	58.5	58.4	58.6	58.6	58.5	58.5	58.4	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


Dose Rate in the Fukushima Dai－ichi NPS
(Measured by monitoring car)
μSv/h
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(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					
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					
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					
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					
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					
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					
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					
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(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 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

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

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

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

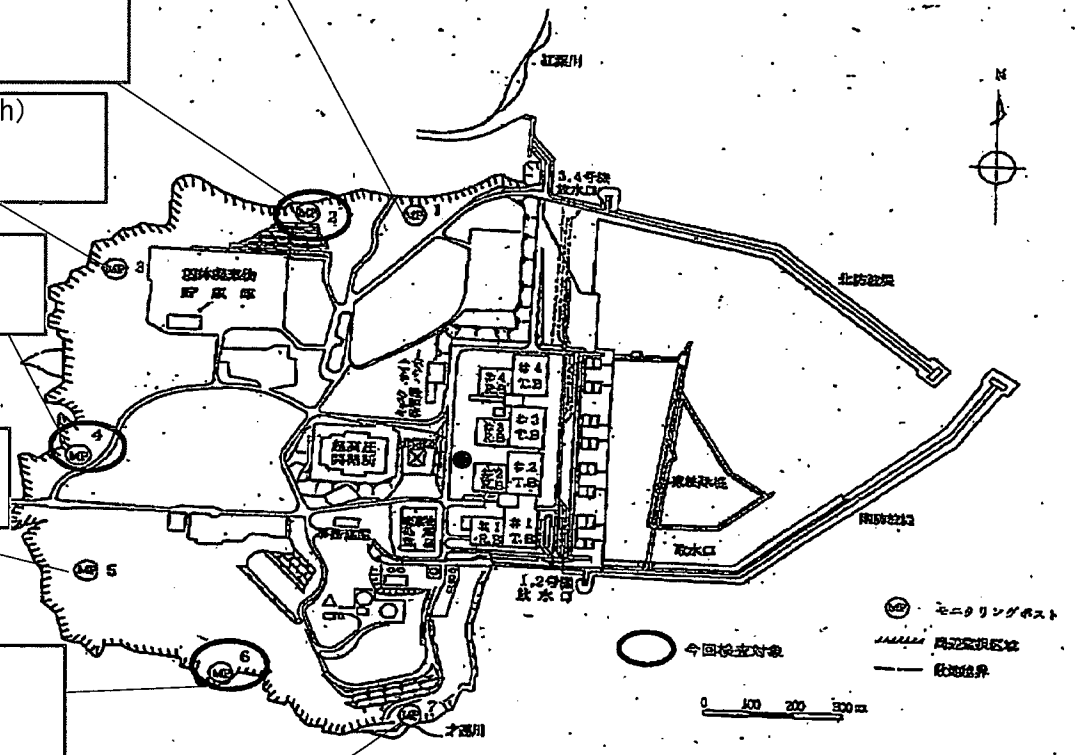
MP4 : 2.999μSv/h (as of 7:00 April 8th)
(Ref. value: 0.036～0.052μSv/h)

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

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

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

Location of Monitoring Post



添付資料 (2)

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

unit: μSv/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)

PPPP/151

(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 08:00 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 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^{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 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)
Mr. Toshihiro Bannai
Director, International Affairs Office, NISA/METI
Phone:+81-(0)3-3501-1087

From: RST01 Hoc
Sent: Saturday, April 09, 2011 1:51 PM
To: RST06 Hoc
Subject: FW: April 9 1500hrs.docx Strawman to update for turnover Please mark up and provide back to me.
Attachments: April 9 1500hrs.docx

Importance: High

From: Miller, Chris
Sent: Saturday, April 09, 2011 1:49 PM
To: Miller, Chris; LIA07 Hoc; ET05 Hoc; ET07 Hoc; RST01 Hoc; PMT01 Hoc; LIA06 Hoc; Bergman, Thomas; Case, Michael; Holahan, Patricia
Subject: April 9 1500hrs.docx Strawman to update for turnover Please mark up and provide back to me.
Importance: High

Thx
chris

PPPP/152

King, Mark

From: USGS ENS [ens@usgs.gov]
Sent: Saturday, April 09, 2011 9:16 AM
To: King, Mark
Subject: 2011-04-09 12:57:49 (Mw 6.1) KYUSHU, JAPAN 30.0 131.8 (29af8)

6.1 Mw - KYUSHU, JAPAN

Preliminary Earthquake Report	
Magnitude	6.1 Mw
Date-Time	9 Apr 2011 12:57:49 UTC 9 Apr 2011 21:57:49 near epicenter 9 Apr 2011 07:57:49 standard time in your timezone
Location	30.013N 131.810E
Depth	21 km
Distances	214 km (133 miles) SE (145 degrees) of Kagoshima, Kyushu, Japan 216 km (134 miles) S (171 degrees) of Miyazaki, Kyushu, Japan 331 km (206 miles) SSE (161 degrees) of Kumamoto, Kyushu, Japan 943 km (586 miles) SSE (151 degrees) of SEOUL, South Korea
Location Uncertainty	Horizontal: 14.0 km; Vertical 8.8 km
Parameters	Nph = 102; Dmin = 356.2 km; Rmss = 0.82 seconds; Gp = 36° M-type = Mw; Version = 9
Event ID	US c0002map

For updates, maps, and technical information, see:
Event Page
or
USGS Earthquake Hazards Program

National Earthquake Information Center
U.S. Geological Survey
http://neic.usgs.gov/

PPPP/153

King, Mark

From: USGS ENS [ens@usgs.gov] Rel
Sent: Monday, April 11, 2011 4:54 AM
To: King, Mark
Subject: 2011-04-11 08:16:13 UPDATED: (Mw 7.1) EASTERN HONSHU, JAPAN 37.0 140.5 (29af8)

7.1 Mw - EASTERN HONSHU, JAPAN

Preliminary Earthquake Report	
Magnitude	7.1 Mw
Date-Time	11 Apr 2011 08:16:13 UTC 11 Apr 2011 17:16:13 near epicenter 11 Apr 2011 03:16:13 standard time in your timezone
Location	37.007N 140.476E
Depth	13 km
Distances	38 km (24 miles) W (260 degrees) of Iwaki, Honshu, Japan 71 km (44 miles) N (359 degrees) of Mito, Honshu, Japan 81 km (50 miles) S (179 degrees) of Fukushima, Honshu, Japan 163 km (101 miles) NNE (23 degrees) of TOKYO, Japan
Location Uncertainty	Horizontal: 12.0 km; Vertical 3.6 km
Parameters	Nph = 584; Dmin = 209.3 km; Rmss = 0.69 seconds; Gp = 18° M-type = Mw; Version = C
Event ID	US c0002n9v

For updates, maps, and technical information, see:
Event Page
or
USGS Earthquake Hazards Program

National Earthquake Information Center
U.S. Geological Survey
http://neic.usgs.gov/

PPPP/154

Disclaimer

This email was sent to Mark.King@nrc.gov You requested mail for events between -90.0/90.0 latitude and 180.0/-180.0 longitude for M6.0 between 08:00 and 20:00 and M6.5 other times. To change your parameters or unsubscribe, go to: https://sslearthquake.usgs.gov/ens/

King, Mark

From: USGS ENS [ens@usgs.gov] Rel
Sent: Monday, April 11, 2011 7:29 PM
To: King, Mark
Subject: 2011-04-11 23:08:16 (Mw 6.4) NEAR EAST COAST OF HONSHU, JAPAN 35.4 140.5 (29af8)

6.4 Mw - NEAR EAST COAST OF HONSHU, JAPAN

Preliminary Earthquake Report	
Magnitude	6.4 Mw
Date-Time	11 Apr 2011 23:08:16 UTC 12 Apr 2011 08:08:16 near epicenter 11 Apr 2011 18:08:16 standard time in your timezone
Location	35.406N 140.542E
Depth	13 km
Distances	77 km (48 miles) ESE (112 degrees) of TOKYO, Japan 107 km (66 miles) S (177 degrees) of Mito, Honshu, Japan 173 km (107 miles) SE (129 degrees) of Maebashi, Honshu, Japan
Location Uncertainty	Horizontal: 14.7 km; Vertical 6.0 km
Parameters	Nph = 282; Dmin = 246.0 km; Rmss = 1.19 seconds; Gp = 50° M-type = Mw; Version = 9
Event ID	US c0002nzx

For updates, maps, and technical information, see:
Event Page
or
USGS Earthquake Hazards Program

National Earthquake Information Center
U.S. Geological Survey
http://neic.usgs.gov/

PPPP/155

From: OST01 HOC
Sent: Sunday, April 17, 2011 7:58 PM
To: LIA08 Hoc
Subject: RE: Japan One Pager 1500 EDT 4-17-11

thanks

From: LIA08 Hoc
Sent: Sunday, April 17, 2011 6:15 PM
To: OST01 HOC; RST01 Hoc; Hoc, PMT12
Subject: RE: Japan One Pager 1500 EDT 4-17-11

No changes for the liaison team. Jeff Temple

Liaison Team Coordinator
US Nuclear Regulatory Commission
email: lia08.hoc@nrc.gov
Desk Ph: 301-816-5185

From: OST01 HOC
Sent: Sunday, April 17, 2011 6:13 PM
To: RST01 Hoc; Hoc, PMT12; LIA08 Hoc
Subject: Japan One Pager 1500 EDT 4-17-11

For editing of 2200 EDT 4-17-11

PPPP/156

From: OST01 HOC
Sent: Sunday, April 17, 2011 6:13 PM
To: RST01 Hoc; Hoc, PMT12; LIA08 Hoc
Subject: Japan One Pager 1500 EDT 4-17-11
Attachments: Japan One Pager 1500 EDT 4-17-11.docx

For editing of 2200 EDT 4-17-11

From: ET02 Hoc
Sent: Wednesday, April 20, 2011 1:21 PM
To: Zimmerman, Roy
Subject: sharepoint info
Attachments: SharePoint info.docx

FYI

DPPP\157

Japan Earthquake/Tsunami Internal Information SharePoint Website

To access the Japan SharePoint page, please visit http://nsir-ops.nrc.gov. Documents in this page are stored in document libraries which can be accessed from the links on the left side of the page. Since the transition to the 6-person response team, the only documents that are continually being updated are the Japan One-Pager, NRC Status Updates, DOE SitReps, and Press Releases (IAEA). These 4 document libraries are at the top of the "Documents" list on the left.

Documents will be posted routinely throughout the day. If you wish to receive a notification when a new document has been posted to a library, click the link to the specific library (ie: Japan One-Pager), then click "Actions" at the top of the list, then click "Alert Me." You may choose the settings of the alerts, however, recommended settings would be to select the following 3 buttons:

Change Type:	"New Items are added"
Send Alerts for These Changes:	"Anything Changes"
When to Send Alerts:	"Send email immediately"

This process needs to be repeated for each document library you wish to receive alerts for. Please let us know if you have any questions. Thank you.

From: LIA08 Hoc
Sent: Wednesday, April 20, 2011 8:55 PM
To: OST01 HOC
Subject: FW: Ops Status/Congressional Report/3 pager
Attachments: USNRC Emergency Operations Center Status 4 20 11 (congressional report).pdf; USNRC Emergency Operations Center Status Update

Liaison Team Coordinator
US Nuclear Regulatory Commission
email: lia08.hoc@nrc.gov
Desk Ph: 301-816-5185

From: LIA08 Hoc
Sent: Wednesday, April 20, 2011 8:27 PM
To: OST02 HOC
Subject: Ops Status/Congressional Report/3 pager

Attached is the updated 3 pager or Congressional report that was sent to OCA on this shift. This document is an abbreviated version of today's Status update.

Specifically, it was sent to Tim Riley and Spiros Droggiitis both of OCA (attached is the email that was sent to them).

Liaison Team Coordinator
US Nuclear Regulatory Commission
email: lia08.hoc@nrc.gov
Desk Ph: 301-816-5185

PPPP/158

From: OST01 HOC
Sent: Thursday, April 14, 2011 6:33 AM
To: Hoc, PMT12
Subject: RE: One pager boardfile - PMT comments

Thanks!

From: Hoc, PMT12
Sent: Thursday, April 14, 2011 6:23 AM
To: OST01 HOC
Subject: One pager boardfile - PMT comments

Attached, tx greg

PPPP/159